SEP 19 1921

Railway Age

SECOND HALF OF 1921—No. 12 SIXTY-SIXTH YEAR

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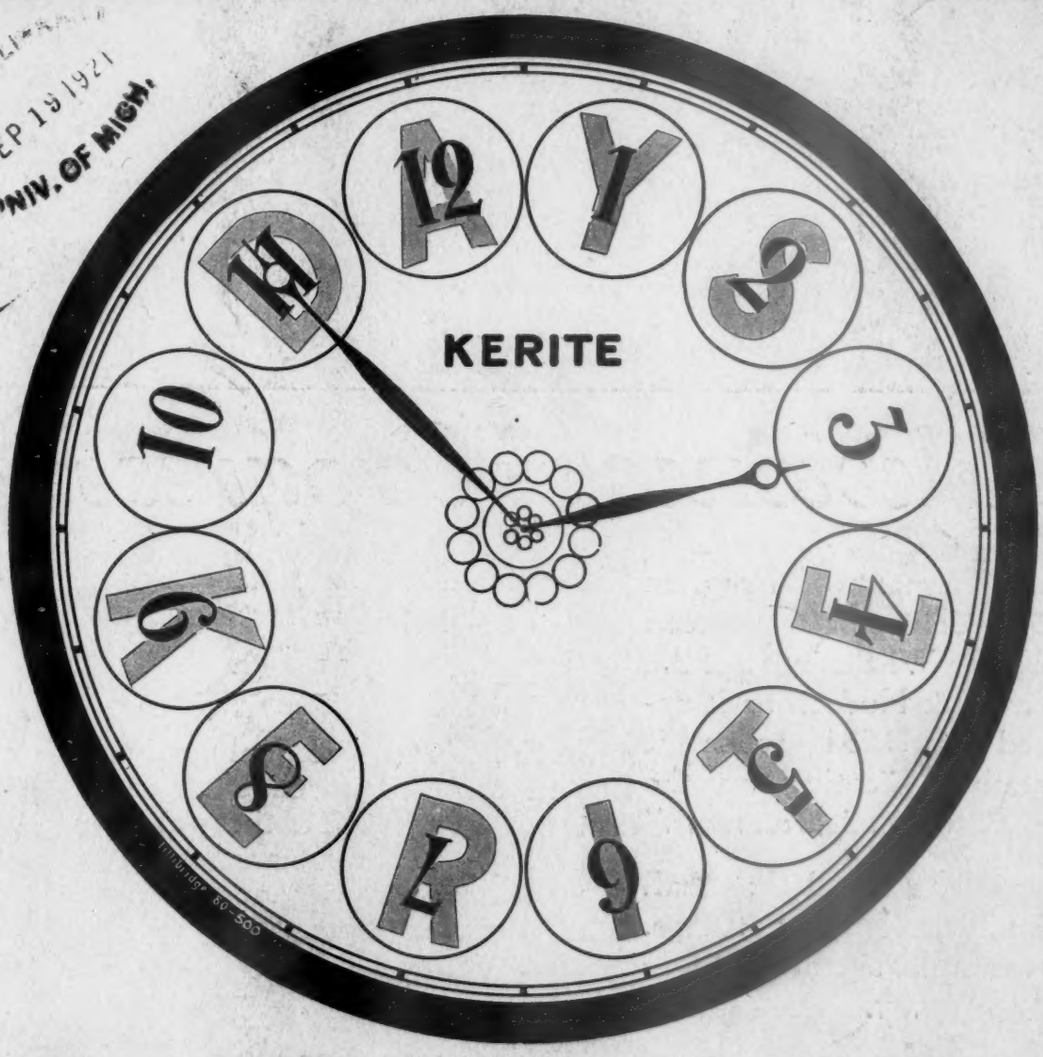

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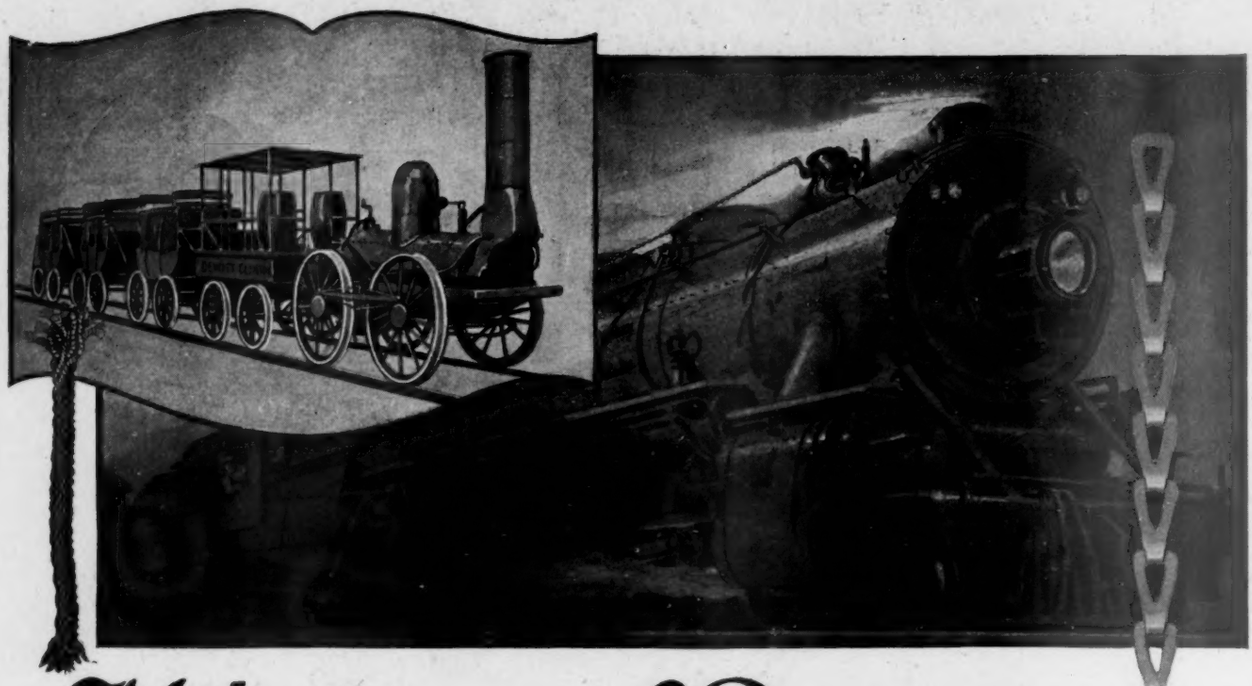

Milestones of Progress

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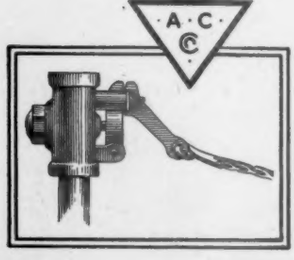

No. 80 "ACCO"

RAILWAY SIGNAL CHAIN *for Conductors' Valves*

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EDITORIAL

Railway Age

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Power Supply for Automatic Block Signals

When considering the approval of estimates for signal improvements, railroad officers should take into consideration that the problem of an efficient signal power supply is changing constantly. The signal engineer must keep informed as to the fluctuating prices of commercial power, primary battery renewals and storage batteries, together with the cost of labor required with each of the three systems. Because of the completion of a new transmission line, that offers an excellent power supply for an alternating current system of signals, it may be desirable to revise plans for a project that had been previously developed as a straight direct current proposition. On a certain proposed installation the original estimate called for alternating current apparatus, but during the past season it was found that the local hydro-electric power company could not offer continuous service. As a result, a direct current system is being considered as the most reliable. Because the circumstances are changing from time to time it would seem advisable that the signal engineer be allowed to reconsider any estimate for a proposed signal installation that has been held up for six months or longer.

Portable Equipment for Handling Bulk Material

A large part of the traffic moved by the railways consists of loose bulk materials, such as sand, stone, coal, ore, grain, etc. The importance of handling such materials into and out of cars in a minimum of time is fully recognized. As a result suitable loading and unloading devices are, as a rule, provided in localities where such commodities are handled in large quantities. There are numerous other localities, however, where the amounts of bulk materials handled are too small to warrant the installation of expensive special fixed equipment. As a consequence inefficient means are often employed in the loading and unloading of cars at these less important points. Under such conditions portable loading and unloading devices which may be easily moved from place to place have proved advantageous in many instances. Such apparatus can be employed more or less constantly and in a number of ways. Probably one of the most widely used of such machines is the locomotive crane. It loads or unloads open-top equipment with equal facility and when the occasion for such service is temporarily past it readily can be utilized in other ways. While the locomotive crane is perhaps more easily adapted to general service than certain other portable loaders and unloaders, all such apparatus offers important advantages which should not be lost sight of in the choice of equipment for such localities.

Does Water Softening Pay?

How many officers are there who, having had called to their attention some incident or obligation in connecting with the performance, operation or upkeep of water softening plants which savors more of expense than of economy or benefit, have not asked themselves the question—does water softening pay? The storekeeper encounters a multitude of requisitions calling for expensive chemicals in car-load lots and, as has occurred in not a few cases, he notes the increased demand upon a stock which, following the introduction of water softening, he had supposed would be needed less—the boiler compound. The superintendent has perhaps had called to his attention the amount of labor involved in keeping the plant stocked with supplies and the expense of operation and repair. He has perhaps encountered a vexing problem of sludge disposal at some points, or has been confronted with the necessity of removing accumulated sediment from one or more of his wayside tanks, or perhaps even of removing the incrustation from an entire underground piping system. Again local officers of the mechanical department unacquainted with pre-softening days or irritated by the restrictions placed upon their use of this or that water, continue to find cause for complaint about water, and finally the higher officer, hearing all this cannot but ask himself whether or not the water softening pays. It is a fair question which merits a fair answer. What then of the report appearing elsewhere in this issue that in one year water softening netted one railroad a saving of 190 per cent on the investment, and another railroad 120 per cent on an investment of more than $200,000? Manifestly this is a performance which if true, or even partially true, supplies an eloquent answer at least to the question—can water softening pay—and thereby makes it a matter seemingly largely dependent on the railroad itself whether or not the process does pay.

Securing Good Results With Concrete

A recent investigation of a concrete building failure disclosed the remarkable fact that it is apparently impossible to produce a concrete of a greater strength than 1,000 lb. per sq. in. at 28 days with the materials used because of wide variation in the results secured with the concrete materials available in railroad work. Railway bridge engineers as a rule are inclined to be more conservative in their designs than are the engineers engaged in concrete building construction. They realize that good results in concrete work demand definite compliance with certain established requirements. Until within the last 10 or 15 years, failures or defects in concrete structures were commonly ascribed to poor cement and there is no denying that the cement was sometimes responsible. But it is now definitely established that nearly all objectionable conditions may be correctly explained by defects in the workmanship or in the materials other than the cement. The requisites for good results are now being established rapidly. They concern the quality of the materials, the proportions including the amount of water used, the thoroughness of the mixing and the protection afforded the concrete after it has been placed in the forms. Nearly all of these conditions are well under the control of the engineer with the possible exception of the selection of materials in which the questions of cost, length of haul, location on company's line and traffic considerations may sometimes enter with varying degrees of influence. Engineers responsible for concrete construction should impress their superiors with the fact that concrete structures in most cases are justified only through their high degree of permanence and that the problem is not one of obtaining permanence in 90 per cent of the structures built, but in a proportion that is as nearly 100 per cent as reasonable expenditures will make possible.

Converting Road Engines to Switchers

Some roads have made a practice of obtaining a large proportion of their requirements for switch engines by rebuilding old freight locomotives. Other roads have tried to keep locomotives in freight service until they are worn out and buy whatever new switching power they need. While the amount of local service will be a factor in determining which practice is advisable, the rebuilding of old power into switchers apparently has numerous advantages. A six-wheel switch engine costs about two-thirds as much as a Mikado locomotive. If a road, instead of buying switchers, spends the same amount for Mikados, these locomotives should release from freight service about as many locomotives as could have been bought new had the money been spent for switching power. If the locomotives to be converted were ready for retirement, the real cost of the Mikados in effect, therefore, would be only the cost of conversion. It would therefore pay to spend a considerable amount to make a thoroughly good switch engine from the old power. Under certain conditions it may be advisable to convert locomotives that are still good for a number of years in road service. This provides an opportunity for getting rid of locomotives that are poor steamers or have troublesome mechanical defects and, furthermore, enables the road to acquire efficient locomotives for road service more rapidly than would otherwise be possible.

Straightforward, Businesslike Methods

Of the many failures in small business enterprises there is no question but that a very large proportion are the result of unbusinesslike methods—of deliveries behind time, goods not up to sample, inaccurate rendering of bills and a reluctance to adjust differences promptly. It is also clear that the same conditions have been responsible for much of the unfavorable attitude of the public towards the railroads and other utility companies. In view of the efforts being made by the railroads at the present time to gain the sympathy and respect of the public, it is unfortunate, to say the least, if some railroads are guilty of unbusinesslike practices in their relations to the shipper and traveler. One grievance in this connection which has been brought to our notice arises from frequent inaccuracies in freight bills and the difficulty which the shipper encounters in securing adjustments of overcharges. This condition has been sufficiently prevalent to cause the formation of freight rate adjustment agencies to handle such cases for the shipper, who is charged very large commissions on all recoveries made. Surely this condition is not conducive to good will. In the first place, the billing by the railroad companies should be so accurate as to give rise to very few complaints, and in the second place, any proper claims should be speedily adjusted. When one considers the wonderful success obtained by some of the large department stores which have been operated on the principle that "the customer is always right," it would seem that the railroads should carefully review their present practices in regard to billing and adjustments for inaccuracies.

Mr. Hoover and Railway Supplies

The Bureau of Foreign and Domestic Commerce is being reorganized by Secretary Hoover on a commodity basis and at the head of each division he is placing an expert in the fields of commerce in that commodity. Thus far eleven such divisions have been formed. They are prepared to extend expert aid to American concerns interested in foreign commerce in iron and steel, lumber, industrial machinery, electrical equipment and supplies, foodstuffs, automotive equipment, fuels, textiles, shoes and leather products, agricultural implements and vehicles and rubber products. Each of these divisions is expected to keep in close touch with trade associations in its branch of industry and to extend every legitimate aid toward the development of our foreign commerce in that commodity. There can be no question of the soundness of such plans. Mr. Hoover is to be congratulated upon the manner in which he has undertaken to make his department of real service to the business community. It is to be hoped that more and more of these commodity divisions will be opened from time to time. To be more specific, when will a division of railway equipment and supplies be organized? Foreign sales of these commodities in 1920 ranked high in the list of our most important exports. The decrease in our exports of these materials during the current year shows that there is a genuine need for such assistance as Mr. Hoover is in a position to give. The trade associations in the industry would doubtless give their hearty co-operation and could assist in obtaining a well-equipped personnel for the new division. There should be no unnecessary delay in extending this service to the railway equipment industry.

Third-Rail Current Collection

The successful operation and low maintenance cost of the third-rail contact system used on the Northwestern Pacific, as described in an article in this issue, is useful information. Actual operating experiences, including mistakes as well as successes, are told in a straightforward manner with no attempt at coloring the facts. Costs are given which are very low. In justice to other contact systems, however, it should be stated that the third-rail will probably be used to a very limited extent on railroads in the United States that will adopt electric operation in the future. Its use will doubtless be limited to certain tunnel operations and to private right-of-way where traffic conditions make 600-volt direct current power the most desirable. Direct current at 3,000 volts or alternating current at 11,000 volts can meet the requirements of hauling heavy trains long distances, but it is not a practicable possibility to collect such power from a third rail. The French Commission on Electric Traction has decided on 1,500-volt direct current for the French State Railways, but it is suitable only for comparatively light traffic and a 1,500-volt third-rail, discounting insulation difficulties, should not be used even on a private right-of-way because of its danger to life. Furthermore, danger to life and danger of personal injury are not due only to the high voltage. A big freight yard full of third-rails in which switchmen get on and off of moving cars is something to stagger the imagination.

Rust-Resisting Plates for Cars

At the time steel cars were first introduced, the prediction was made that they would have an indefinitely long life. Experience has shown that this is not the case. The plates have failed after comparatively short service due to corrosion, necessitating costly repairs and in some cases complete rebuilding of the car body. Rapid deterioration due to rust is not confined to railroad equipment and engineers have given the subject attention for some time. An investigation which sheds new light on this matter has been conducted by a committee of the American Society for Testing Materials. This committee started a series of tests of sheets of various chemical compositions in 1916. Plates were exposed in three characters of atmosphere: in the industrial air of Pittsburgh, Pa., the pure air of an inland district at Fort Sheridan, Ill., and the salt air at Annapolis, Md. Practically all classes of iron and steel were included in the tests, which have now progressed to a point that enables definite conclusions to be drawn. It has been found that the presence of copper in

amounts as low as one-tenth of one per cent causes a marked decrease in the rate of corrosion. These tests are sufficiently conclusive to warrant the expectation of much longer life from copper bearing sheets than from plain sheets used in car construction. The increase in cost is said to be comparatively small. The work already done is valuable and should go a long way toward a correct solution of the problem. However, the expenditures for equipment are so great that thorough investigation should be carried on and every promising method of reducing corrosion tried until the most economical material is found.

Reorganizing the Railways of Britain

With the grouping of all the railways of Great Britain into four large systems, changes in organization will doubtless be necessary. The present organization of the companies is departmental, centralized in the general manager to whom the heads of the various departments—operating, traffic, mechanical, engineering, etc.—report. There is no question but that this form of organization has in the past proved highly successful and probably no one would venture to suggest a change were it not that with greatly enlarged systems the general managers will not be able to give the same attention to detail as heretofore. The eight principal railways which go to make up the North Western group, for instance, aggregate 7,326 miles of main line,—a good sized railway even from an American point of view. The average length of the constituent railways, however, is now only a little more than 900 miles. Obviously the enlarged systems cannot reasonably expect the same accomplishment from a highly centralized management that the smaller companies can. The Railway Gazette (London) suggests as a possible solution the adoption, with certain modifications, of the form of organization in use in this country. The plan proposed provides for a president and, reporting to him, three vice-presidents. The first of these would be the "manufacturer of transport," and would be in charge of the operating, mechanical and engineering departments; the second, the "seller of transport," would be in charge of freight and passenger traffic; and the third, the "financial controller," would direct the affairs of the financial, legal, accounting and real estate departments. Some such plan as the one proposed will probably be adopted eventually and the study of this problem is quite as important as many others which the British railways must solve. American experience in railway organization will doubtless be of great value to those who are undertaking this task.

Record Breaking Grain Traffic

THE RAILROADS have made a wonderful record during the past few weeks in the handling of the grain movement, which has exceeded in volume that for the corresponding period of any previous year. For the eight weeks ending August 27 the loading of grain and grain products was 465,839 cars, as compared with 302,623 in the corresponding period of 1920 and 381,736 in 1919, and from January 1 to August 27 this year 1,486,954 cars were loaded with grain and grain products, as compared with 1,195,485 in the corresponding period of 1920 and 1,424,416 in 1919.

The fact that this heavy early movement has been handled practically without complaint of car shortage is due not only to the lessened demand for box cars for other kinds of traffic this year, but more particularly to the careful plans made to avoid a car shortage which it was feared might develop because so large a percentage of the cars are in bad order. On August 15 there were 16.6 per cent of all the freight cars in bad order and 18.2 per cent of the box cars. The plan of campaign adopted was to exert unusual efforts to confine the cars that were fit for grain in the grain traffic and to keep them from being diverted to other traffic, which might necessitate re-coopering, if not more extensive repairs, before they could be used again for grain. Officials and inspectors both of the Car Service Division of the American Railway Association and of the Service Bureau of the Interstate Commerce Commission have been stationed at the principal centers of grain traffic and by persistent efforts to bring about an adherence to car service rules, have managed to accomplish practically a shuttle service between the grain fields and the elevators, which has enabled the record-breaking traffic to be moved with unusual expedition.

In addition to the fact that the crop in the southwest ripened this year a little earlier than usual, it is understood that the grain producers have been hurrying their shipments to market to realize the cash as early as possible. Secretary Hoover of the Department of Commerce is quoted as saying that the unprecedented exports of wheat during August should react favorably on agricultural and business conditions throughout the country, and should particularly ease the credit situation in the grain territory. The movement so early of so large a portion of the year's crop should also relieve to a very considerable extent the strain which is usually felt by the railroads during the fall months. On August 31 they still had a surplus of 68,938 serviceable grain cars and in eight months of this year the roads have moved 81 per cent of the amount of grain they moved in 12 months of 1920.

English Bridge Engineers Consider American Practices

THE DESIGN and construction of railway bridges in America and Europe have followed independent courses. Differences in the loading requirements on the two continents and marked diversity in the relations between the costs of labor and material have no doubt caused the American and European bridge engineers to feel that they had little in common and that, therefore, they could gain nothing from the study of each other's work outside the realm of pure mathematics. Because of this fact, which is well-known among American railway bridge engineers, they will learn with some elation that English engineers are now seriously considering the adoption of one American design practice which differs in a marked way from that which is now in common use in their country. This refers to the method employed in making allowance for the impact of rapidly moving loads.

While American engineers have now accomplished almost a complete transition from the old Cooper method of separate dead load and live load stresses to the use of a proportional increment in the live load, English bridge designers are governed by certain long-established Board of Trade rules founded on arbitrary rather than scientific considerations. Canadian practice has followed closely that of the United States. In fact, except for minor differences in official specifications the practices may be said to be identical. What is of even greater interest is the fact that the railways of India have been using the Pencoyd impact formula for a number of years and have taken steps from time to time to keep closely in touch with the latest developments in American bridge design practices.

No doubt, it was the advanced practice by the two colonies which eventually influenced the engineers of the mother country to review their own methods of allowing for impact in the design of railway bridges. English railway engineers are now studying the results of tests made during the past year on 20 English railway bridges with a view to the establishment of an impact formula suitable to English railway conditions but which will be applied along lines similar to those prevailing in this country. In this connection, it is

of special interest to note that the Railway Engineers' Association (English) has definitely recommended the adoption of the Pencoyd or Schneider formula, which was the established standard of the A. R. E. A. until it was abandoned in 1917 in favor of the new

$$\frac{300}{300 + \frac{L^2}{100}}$$

Major A. Mount, inspecting officer of the Minister of Transport, who prepared a report on the tests, pointed to the exorbitant allowance for long span bridges under the Pencoyd formula, but opposes the adoption of the new A. R. E. A. formula in favor of one of his own selection which gives values of more than unity for spans less than 30 ft. long. The justification for this is that tests made on the English bridges gave very high values for certain floor members; it is entirely possible that English bridge loading details are such that the actual impact formula adopted cannot consistently coincide with that now the standard in this country. It is, however, a matter of no little satisfaction to American bridge engineers that the methods which they were instrumental in effecting for use in this country are gradually finding application eleswhere.

Improve the Quality of Repair Work

THE IMPORTANCE of emphasizing quality vs. quantity shop output was pointed out in an editorial in last week's *Railway Age*. The question naturally arises: How is it possible to obtain a better grade of railroad repair shop work and raise maintenance standards to the desired point? Probably the most important step to this end would be in the further development of able, conscientious inspection forces for both repair shops and roundhouses. It is absolutely essential that locomotives and cars be carefully and periodically inspected to discover which parts are subject to undue wear and which show evidences of possible failure.

After inspection, the next step is to get reported defects corrected promptly and properly. An adequate number of competent repairmen must be available for this purpose and as far as possible the work should be assigned, each man being held individually responsible for the correct performance of his particular assignment. It is only in this way that work of the best quality can be assured and equipment released from the shops in condition to make the stipulated mileage before coming in again for heavy repairs. If, due to inferior workmanship, the required mileage is not made there is a serious reduction in revenue-earning hours.

Good inspectors are needed and capable shopmen, all of whom should be made to feel that the managements expect a reasonable amount of high quality work, with emphasis on the quality. The idea which workmen have regarding executive officers is determined largely by personal contact with the foremen, but the foremen themselves can never impart an enthusiastic desire for good workmanship unless that desire is in turn transmitted to them from the higher mechanical department officers. The latter must start the ball rolling.

There is nothing so conducive to interest as competition. Why not start a competition between the various shop foremen to determine which one turns out the best work, or, at least, which one goes the longest without a failure chargeable to his department? This would provide a valuable incentive for careful work. Then again, personal pride in good workmanship may be encouraged and thus help raise the standard of locomotive and car maintenance. Very often, for example, a gang foreman becomes noted for turning out "smart locomotives," meaning by that locomotives which get up speed quickly, have square valves with clear-cut, even exhausts and show no evidence of the "lazy" action sometimes found. Both gang foreman and repairmen take pride in the care and workmanship which make enginemen praise the locomotives they have repaired. If other foremen in all departments could be imbued with the same spirit, it would be hard to estimate the number of accidents prevented, the increase in revenue-earning hours of equipment and the reduction in maintenance expense.

Robbing Peter to Pay Paul

WE HAVE REFERRED editorially in recent issues* to the direct interest of the railways in the extensive highway construction program now underway and have urged them to give more direct attention to the manner in which the money they are paying in taxes is being spent for the construction and maintenance of these roads. There are other phases of this highway construction program which demand equally serious attention. When the "good roads" movement was in its infancy, the support of the railways was solicited and given freely. The action of the railway executives in pointing out the value of improved roads to the farmer as an aid to him in bringing his products to the railway for shipment to market, independent of the weather, did much to create a favorable public sentiment.

Once this sentiment for improved roads was aroused, however, highway development has been carried on largely parallel to and in competition with the railways, rather than supplemental to them. The result is that this new avenue of transportation is of little aid to the farmer remote from the railway and most in need of relief. Also in return for their earlier co-operation and support the railways find the effect of the highway construction program is, in large measure, detrimental rather than otherwise.

Unmindful of this, the highway construction advocates were among the most active in their criticism of the railways for their inability to furnish cars for the moving of the large quantities of road-building materials last year. They have likewise been active in agitating for the reduction of rates on materials used in this work. Quoting from the Litchfield County (Conn.) Leader, "It seems a bit like irony for the convention of the American Road Builders' Association at Chicago, to demand that the railroads lower the price of transportation on all materials, cement, crushed stone, etc., used to build highways. The same highways, of course, are designed to make more efficient and economical the use of trucks which are fast taking away the business of the railroads. Isn't it 'crowding the mourners?'"

The direction which the highway construction program has taken also raises another question regarding the extent to which the railways should be required to contribute to the building of these thoroughfares over which other agencies can divert a large amount of the traffic now handled by the railways. This question has already been raised in the courts in a number of instances. In a decision handed down by the United States Supreme Court on June 6, 1921, on a petition brought by the Kansas City Southern against a road improvement district in Arkansas the court stated that "It is doubtful whether any substantial appreciation in value of the railway property within the district will result from the improvement." Obviously if no benefit is obtained, an assessment against the railroad based on benefits to it in common with other property owners within the district, can not be sustained. In view of the changes in the form which the highway construction program is now taking, it is to be expected that the relation of the railways to this program will be modified greatly. This subject is worthy of the most serious attention of railway officers for it has many far-reaching ramifications.

*August 13, page 278; August 20, page 321, and August 27, page 394.

Letters to the Editor

A Question

NEW YORK.

TO THE EDITOR:

The rumors which are in the air at the present time about the large railroad bridge to be built across the Hudson brought back to me a short article in a French magazine (title of article and magazine forgotten) which I had read some time ago. It came back much as a tune we heard somewhere will come back a few weeks or months later to haunt us and set us wondering what it is and when and where we heard it. Though I cannot truthfully say that the article is haunting me, yet it makes me dream once in a while, and just as the dreamer, when he wakes, feels the urge to tell his dream to somebody else, so do I feel the need of unburdening myself. This is the dream:

There are now in existence certain alloys which compare in strength with mild steel, such steel as is used for structural work. These alloys weigh only about one-third as much as steel, volume for volume. Let us see how these two metals compare when we make a bar of each of them and lay them on supports such a distance apart that the bar is about to break by its own weight. Let the distance between supports be I inches; let the bar be of square section with a side a for the steel bar and a_1 for the alloy bar; let the weight of a cubic inch of steel be w and of a cubic inch of alloy $w_1 = \frac{1}{3}\ w$.

This bar of steel will weigh Ia^2w, and as this is the load which is evenly distributed over a length I, the bending moment will be

$$M_b = \tfrac{1}{8}I^2a^2w$$

If the fiber stress caused by this moment is S, we find

$$\tfrac{1}{8}I^2a^2w = \tfrac{1}{6}Sa^3$$

$$a = \tfrac{3}{4}\frac{I}{S} \times w$$

Similarly we find

$$a_1 = \tfrac{3}{4}\frac{I}{S} \times w_1 = \tfrac{3}{4} \times \frac{I}{S} \times \tfrac{1}{3}w = \tfrac{1}{3}a$$

We see, then, that the side of the section of the alloy bar will be $\frac{1}{3}$ of that of the steel bar, so that the area of the section will be 1/9 of that of the steel bar and, as both bars have the same length, its volume will be 1/9 of that of the steel bar. Remembering that its specific gravity is $\frac{1}{3}$ that of steel, we see that the weight of the alloy bar will be 1/27 of that of the steel bar.

If we were confronted with the problem of laying such a bar across a long span (let us say the Hudson river), we would investigate the prices of the two kinds of material and we would come to the conclusion that the alloy is cheaper so long as it costs less than 27 times as much per pound as steel. If we had to provide the supports also we would naturally consider that they can be made much lighter and do not require such costly foundations if the alloy is used, and we would not forget that the trouble and expense of putting the bar in place would be very much less; all which factors are in favor of the alloy even if it should cost 27 times as much per pound as steel.

As nobody has ever indicated a desire to lay a bar of steel across the Hudson river, it might well be asked what this is all about. The answer is this: that a long span bridge is, in many respects, a bar laid on two supports and loaded with its own weight. But what about the live load? The heavy trains crossing the bridge? It has been remarked that the presence of a train on a long span bridge may be compared to a fly sitting on the washline. The fly does add to the load, but not very much. There are, however, various other things which do add materially to the load, such as the roadway, the tracks, the bracing for wind pressure, etc.

Granting that there are such disturbing factors, the question remains: Does not a long span bridge resemble a bar laid on supports sufficiently to make it worth while investigating whether there are not conditions under which the lighter, though higher priced, alloys can be used to advantage? Of course, this much remains certain: That unless a very large portion of the load is the weight of the structural material itself the cheaper material is bound to win out. It might well be, however, that the proportion of load caused by the weight of the structural material is so large that lighter materials might be used to advantage.

A. L. DELEEUW.

The Mechanical Association

NEW YORK.

TO THE EDITOR:

The railroad officer who signs himself "Mechanical Engineer" and who wrote the letter entitled "Revive the M. M. and M. C. B. Associations," which was published in your September 10 issue, page 479, was a mighty poor diagnostician. The trouble is not with the present organization of Division V—Mechanical, A. R. A. The fault lies much deeper than that and was just as true when the M. M. and M. C. B. Associations were in existence as it is today.

The fundamental trouble, in my opinion, is that the officers of these associations were lacking in vision when they laid out the programs and assigned the committee work. With a few exceptions, which stand out in bold relief, the reports and papers read before the mechanical associations have concerned themselves with details of design and construction, or in the development of recommended practices for operation and details of maintenance.

These are important, so far as they go. They are more or less in line also with the kind of reports and papers which in past years have been presented before our national engineering and technical associations. Times have changed, however, and even men in the strictly engineering professions have come to realize that after all, improved and more economic production requires a knowledge of the principles of good management and understanding of how to deal with men. The mechanical department has in its control large numbers of men working in various and widely different capacities. The problem before the railroads today is that of men and how to handle them, and yet where have the mechanical associations ever really shown a realization of this problem? The American Railway Engineering Association has a standing committee on the economics of labor. Is it not even more important that our mechanical associations should at least go as far as has this sister organization?

Then there is the great field of operation. Is the mechanical department entirely disinterested in indicating how to get the best results from a locomotive or how to determine what class of power should be ordered? Has it no interest in understanding, and in helping other departments to understand, the economics of operation? What have the mechanical associations ever done to throw real light on the larger problems such as these? Have mechanical department officers, like the ostrich, got their heads buried in sand?

The *Railway Age* had a long article in its issue of June 10 entitled "Mechanical Department Must Tackle Big Program," and a similar one in the issue of August 20 entitled "Will the Mechanical Department Make Good?" You tried to show what were the really big problems before the railway mechanical world today. Did you intend to throw into bold contrast the fact that the program of Division V—Mechani-

cal hardly touches in even the remotest way upon the most important of these problems? Nor have the M. M. or M. C. B. Associations ever shown any real interest in them.

No, the trouble is not that the M. M. and M. C. B. Associations have lost their identity; the real trouble is that these associations and their successor, although they have done remarkably fine work in certain directions, have never even scratched the surface of some of the larger mechanical department problems. Is it not time that something was at least started in this direction?

WEE GA.

Keeping Turntable Open in Winter

DETROIT, Mich.

TO THE EDITOR:

The article entitled "Cover to Keep Out Snow Complicates Turntable Replacement," which appeared in your issue of August 27, page 412, suggests the importance of a positive and suitable method of eliminating heavy snowfalls from turntable pits and roundhouse tracks. Railroading under cover is expensive, although necessary, in such extreme cases as that described at White River, Ontario.

A comparatively inexpensive expedient is an arrangement for holding and heating a considerable depth of water in the turntable pit for the purpose of melting the snow. There are two locomotive terminals so equipped in Calumet, Michigan, where the annual snow-fall frequently reaches 112 in. and where winter winds and temperatures are especially severe.

The turntable pit is of ample depth, the concave floor being of concrete and draining into a 10 in. sewer through a vertical flanged cast-iron pipe on which an extra length of pipe is coupled for winter use. The top of this inlet extension is placed at an elevation only slightly below the base of the turntable center to protect it against overflow. At the beginning of winter the extension pipe is put in use, the pit is filled with water which is heated and kept continuously hot through the use of exhaust steam from a line in the roundhouse. Any snow which falls between the turntable and the roundhouse melts readily when shovelled into the pit. This arrangement has proved so economical and has given such unfailing service under all emergency conditions that it would seem applicable in all but the most extreme climates. The chief points to be observed are the arrangements for a suitable depth of water below the turntable center and the continuous application of heat. Almost any existing turntable pit with a concrete floor can be inexpensively fitted for winter operation as described.

E. R. LEWIS.

Unnecessary Transferring of Loaded Cars

GREENVILLE, Texas.

TO THE EDITOR:

Transferring of loaded cars at interchange points is one of the most abused and unnecessary practices imposed upon common carriers by the American Railway Association rules. The railroads of this country pay out millions of dollars each year for labor in unnecessarily transferring loads. This delays traffic, causes damage claims and runs up the per diem, because some narrow-minded car inspector or disinterested car foreman or bureau of interchange inspector is too technical in applying the A. R. A. rules.

Lading is transferred for slight defects to the cars that could be repaired in fifteen or twenty man-hours or less, or in many cases they could be run with perfect safety. I have found that at points where interchange bureaus are operated this practice is more pronounced than at points where the lines interchange with their own inspectors. Cars will be carded for transfer and the receiving line pays the per diem, the delivering line paying for the labor of transferring the lading; both participate in the claims arising from such transfers and, incidentally, the shipment is delayed. I have found cars passing through the interchange which were carded by the inspector to transfer the loads; these transfers were made by the receiving line and the cars were returned empty to the delivering line; the empties were then loaded without any repairs being made to the cars and such cars have passed from three to four interchange points in the next 30 days without any exceptions being noted.

There should be a rule that all cars that could be repaired within 24 man-hours should either be run or repaired at the receiving line's expense. Of course, if a car is not safe to run it must be repaired and if it cannot be repaired within less than 24 man-hours, the load should be transferred and the delivering line billed as per A. R. A. rules 2 and 14.

There are more pernicious practices growing out of the technical application of the A. R. A. rule applying to this matter than to any other three rules in the code. This results in delayed equipment, increased per diem expense, labor expense for making the transfer, claims arising from the transfer, and delay to the commodities. Inspectors, transfer contractors, contractor laborers, etc., are, in a great many instances, vitally interested in the transfer of cars. The number of the cars transferred fluctuates with the car situation; when cars are scarce the ratio of the number of transfers to the number of cars handled decreases, but when equipment is plentiful the inspection is more critical and a more technical application of the A. R. A. rule is followed. The flash-light is then brought into use at some points.

I am sure a reasonable remedy can be found without forfeiting any of the precepts of safety.

R. R. FARMER,
Superintendent, M. K. & T.

Railroads as Manufacturers

NEW YORK.

TO THE EDITOR:

When in railroad service I found greatest difficulty in doing a bit of manufacturing because my plans went awry. Material was ready but the men were not. The men were ready and material was not. The cost was scandalous. I am not proud of the real cost of the standard parts I ordered but I was never called to account, because the officers I reported to wanted the road to make everything that it could make. It seemed economical; but was it?

Even in these times railroads are asking manufacturers for drawings of locomotive parts the patents for which have expired. Even in these times they are making these themselves. It is and always will be a financial mistake for anybody whose time is valuable in his particular line to deviate from that line and try to play the part of some one else. An artist on the harp seldom can be also an artist on the slide trombone. The business of the railroad is to transport. To manufacture is foreign to its ideals and also to its possibilities. Every railroad job—particularly as applied to the mechanical department—is an emergency. It is necessary to get this engine or that engine back into service as quickly and as cheaply as possible. Engines cost money. Every moment they lose in the shop or at the roundhouse increases the cost of transportation. To interfere with the repair program of locomotives or car equipment is a mistake and a costly one.

Railroad labor is high in cost. It is higher than railroad history has ever known. Railroad labor is not gifted in manufacturing. It is accustomed to work on this job or that, different work for every emergency that every day brings. It is really too much to ask repair forces or men allied with

repair work to manufacture anything on a proper cost basis. To be successful, manufacturers must get volume of work. No railroad shop can have sufficient volume to keep men steadily employed on specialties to make any money out of them. When you build fifty locomotives all alike the cost per engine is less than when you build two or three.

Manufacturers deal in volume. Naturally they can reduce costs by fitting up to use automatic machinery, to study out the cheapest methods of doing the work; and they can manufacture at less cost than anybody but specialists can reach. Time is required to find blue prints, to get material, to set up the machinery, to put the work in the machines. Time and money are required to make gages, fixtures, jigs and templates. All this goes into the "overhead" of the railroad that attempts manufacturing; but unfortunately it is concealed and the actual cost of railroad manufacturing is never known. Manufacturers must know these elements of cost or they go "broke."

Of all times this is the time for the roads to reduce the cost of transportation. It can best be done by applying every effort to reduce the cost of maintenance of equipment and by leaving manufacturing to those who are equipped with machinery, who have experience and knowledge of every detail of manufacturing. How would the railroads make good in the manufacture of rail or of bridge material? How will they make good in manufacturing anything else except transportation, which is their real problem?

This communication is called forth by your comments on page 332 of your impression of August 20, 1921, under the heading—"The Manufacture of Standard Repair Parts."

It is the subscriber's belief that no railroad can afford to make any standard repair part that it can buy. Every time railroads do any manufacturing of things they can better buy they cost their stockholders money that those stockholders cannot afford to lose, especially now.

G. M. BASFORD.

Railroad Opportunities as Seen by a College Student

PROGRESS, Pa.

TO THE EDITOR:

As an undergraduate in the transportation engineering option of civil engineering at the Massachusetts Institute of Technology, I have been very much interested by the current discussion in your columns in regard to the railroads and college men. So far as I know, the railroads are not getting men from M. I. T.; they are not trying to get them. Other industries are getting our men; but they come after them. To me, that means railroads either do not want college-trained men, or, at best, they are satisfied with an inferior grade. If railroads do want college men, in order to get them they must make an effort equal to that of other industries. Except, perhaps, in this rather unusual year, graduates from the country's best technical schools are not out looking for a job, in which, if there is any future at all, it is doubtful and remotely placed with respect to time. This is not because the college man has an exaggerated estimation of his worth, but because for a day's work he feels entitled to a day's pay.

M. I. T. is one of the institutions which do not overspecialize on the technical ends. In its course of railroad transportation, including such subjects as economics, railroad design, railroad operation, etc., it would seem that the ideal expressed by Vice-president Ennes, of the Wheeling & Lake Erie (*Railway Age*, August 20, 1921, page 323) were reached as nearly as possible. Yet railroads do not recruit from M. I. T.

The reason railroads shun college men is apparently that they prefer to stagger along with less highly trained, less expensive, yet often inefficient help, blinding themselves to the progress of other industries employing college trained men in responsible positions with the time-worn statement that railroading is specialized work, and that it can be learned only if you had no specialized training at the start and by years of monotonous routine at some inconspicuous job. Personally, I cannot believe that the transportation industry is so much different from the hundreds of others, which wait outside the doors of our universities and technical institutions each June to pick their future leaders.

The sooner the railroads get away from the old idea that because they always have done so and so they always will, and as the last big industry to turn the corner, find that the trained and disciplined mind, as represented by the best college graduate, can do for them what it has for the steel and manufacturing industries and construction corporations, the better it will be, both for them and for the country at large. A recruiting system as outlined by Mr. Hanson in "How Sincerely Do Railroads Want College Men" (*Railway Age*, July 16, 1921, page 121), would be a big step in this direction.

A P. R. R. "SUMMER-CHAINMAN."

Non-Interlocked Railroad Crossings

ST. PAUL, Minn.

TO THE EDITOR:

On page 1165 of the *Railway Age* of May 20, 1921, appears an article entitled "Non-Interlocking, No-Stop Railroad Crossing." I was of the opinion that this arrangement was more or less common throughout the country but it seems that there are many who think it is new and that it needs to be tried out. It will therefore, no doubt, be interesting to your readers to know that on the Northern Pacific there are 21 junctions of branch lines and foreign main lines connecting to the main line, 6 of which are double-track junctions, which are protected in a manner similar to that outlined in the article above referred to.

With reference to automatic signal arrangements at crossings in lieu of interlocking; while we do not have crossings of exactly this nature, we do have gauntlet tracks over three different bridges which introduce practically the same conditions as exist at crossings. The most important of these is our gauntlet over the Yellowstone river bridge at Billings, Mont., which is used by the main line trains of the Chicago, Burlington & Quincy and the Northern Pacific. There are also a great number of switching movements over this bridge. The movement of trains over the gauntlet is treated as single track operation. The normal position of the distant signals on both the eastward and westward tracks is "Caution." The normal position of the home signals is "Stop." The circuits are so arranged that the clearing of one home signal holds the other at block, but after the train using the cleared route has passed out of the track circuits involved in the gauntlet operation, a second home signal will clear if there is a train on its preliminary section.

We have never had the slightest trouble or any near accidents with this signaling arrangement. There is no difficulty in designing a circuit that will take care of any railroad crossing and that will work at all times. In fact, it is not quite so difficult as a great many of the absolute-permissive-block circuits for single track, and as far as safety is concerned, I consider a railroad crossing automatically signaled safer than a piece of single track automatically signaled. On a single track automatically signaled, if two trains should get away from stations at the same time, heading towards each other, they would be stopped by intermediate signals and one of them would have to back up to a siding to let the other pass. At a railroad crossing, or a gauntlet track, if two trains should strike the preliminary or clearing section at the same time, the signals for one train only would

clear and after that train had gone the other route would clear and no flagging would be necessary.

It is my opinion that for automatic signaling at a crossing, the signaling should be arranged so that a distant signal would show "Stop" if the home signal were at "Stop," and be a permissive signal to permit trains to stop and then proceed with caution to the home signal. The train would then proceed over the crossing when the home signal cleared or would have to flag over if there was a signal failure. It will be seen that under a good system of automatic crossing signaling, trains could get out of each other's way much quicker and with more safety than they can when they meet between sidings on single track.

In 1899 the Rowell-Potter Signal Company installed an automatic interlocking at a crossing of the Peoria, Decatur & Evansville with the St. Louis, Peoria & Northern at Hawley, Ill. This interlocking was in full operation for some time and I believe was approved by the Railroad Commission of Illinois.

In the earlier days of signal devices on railroads, when the discipline among the trainmen was very poor, it was necessary to install derails to enforce the observance of signals, but today with good discipline on the majority of roads, there is no more need of installing derails to enforce the observance of home signals at interlocking plants than there would be to install a derail back of every automatic block signal and particularly on single track.

C. A. CHRISTOFFERSON,
Signal Engineer, Northern Pacific.

The Protection of Highway Crossings

BALTIMORE, Md.

TO THE EDITOR:

Various means have been devised to educate the motorist to exercise caution when approaching a railroad crossing. At all highway crossings signs are displayed, and in many cases a watchman or automatic signal is provided to give warning. Although many crossings are protected by watchmen, the highway crossing signal has been widely adopted because of its comparatively low cost.

The most universal form of highway crossing signal is the audible alarm, commonly known as the crossing bell, consisting of an electric bell mounted on a post and connected through a relay to a track circuit. Such a device has two serious drawbacks. The first (not of much importance 25 years ago) is that it is sometimes impossible to hear the bell when riding in a closed automobile or when driving a car with a noisy engine. The second objection to the audible signals in use is the fundamental principle upon which they are operated, namely, that it takes energy for the signal to display its restrictive indication; should the source of energy fail, the signal would give no indication that it is out of order. In other words, it would fail on the side of danger.

In view of the drawbacks to the audible signal, a number of railroads are replacing this type of warning with a signal that will give a visual indication. There are four principal types of visual crossing signals: (1) the swinging disk, operating on an open circuit; (2) the three-aspect swinging disk giving a failure indication; (3) the flashing light signal, and (4) the strictly closed circuit position-signal, its restrictive indication being displayed by a banner released by gravity and a flashing light.

Due to the importance of the function which the crossing signal must perform, it must be more than mechanically perfect. It must be psychologically perfect. That is, it must be of such a design as to attract the attention of the most careless motorist. The light signal, though on the open circuit principle, is, because of the absence of moving parts, mechanically perfect. But is it psychologically perfect? Will the motorist, driving at forty miles an hour, observe this red light? How will he construe it, especially at night?

A moving or a flashing light attracts the eye, but a crossing signal should do more than merely attract attention. It should convey a definite meaning—*stop*. The flashing or moving light is a bait to attract the motorist's attention. But it must do more. It must awaken him to the seriousness of the occasion; and this can be done only by utilizing the English language; by displaying a banner lettered with the word "STOP."

A crossing signal of this nature, combining the effectiveness of the flashing light and the definite warning as expressed by a banner displaying "stop" on the approach of a train, is both mechanically and psychologically perfect. The operation of an arrangement of this sort is very simple. The flashing light, necessarily operating on an open circuit, is connected to its electrical source through the back contact of a track relay; while the banner mechanism, operating on a closed circuit so as to display the warning by gravity, is connected to the same electrical source through the front contact of the track relay. An approaching train, de-energizing the relay, will cause the stop banner to be displayed by cutting off the current from the banner mechanism, and at the same time displays the flashing light by making a connection from the electrical source to the lamp by means of the back contact of the relay. In this arrangement we have a device that lives up to the three requisites of a crossing signal, namely: the flashing light to attract attention, the definite warning, "stop," and the closed-circuit banner mechanism which, in the event of a failure of any part of the device, will cause the display of the stop indication.

The railroads in installing highway crossing signals are spending large sums of money solely for the benefit of the public. And yet it is a known fact that many motorists wilfully disregard crossing signals. If an accident occurs the railroads are usually blamed, when in reality it is the result of carelessness on the part of the motorist. The public should be made to realize what is being done for its protection by the railroads. The motorist should be made to obey crossing signals as he is made to obey police-operated traffic signals in city streets. Let the various state legislatures take it upon themselves to co-operate with the railroads. It is their duty to inspire the officers of the law with the energy, vigilance and courage necessary to enforce the law requiring proper observance of highway crossing signals; do this and the number of accidents at such crossings will be very greatly reduced.

CHARLES ADLER, JR.,
Signal Engineer, Maryland & Pennsylvania R. R.

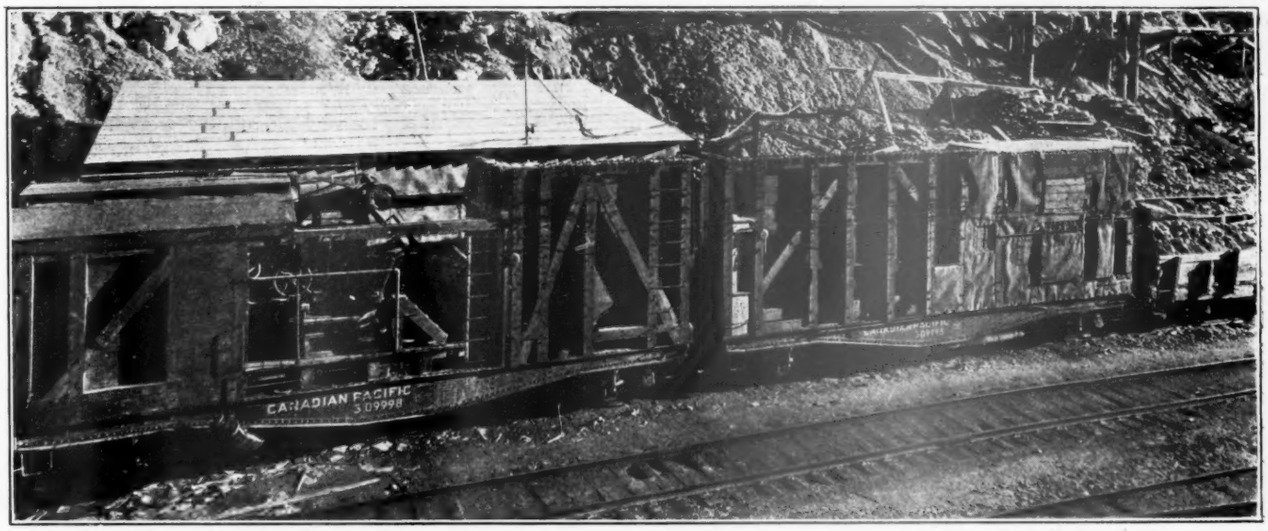
Are Derails Necessary?

LONDON, Eng.

TO THE EDITOR:

In his article in the issue of the *Railway Age* for July 16, page 112, A. H. Rudd raises a question about the utility of derails which is interesting to English readers, since in this country we have, for a long time, been in the position he suggests, that is, without derails on passenger tracks, although they are used in certain circumstances on freight tracks. We find it better so to arrange our signals and block working that trains are kept back a safe distance from fouling or crossing movements and to do without the derail, which, as Mr. Rudd observes, may easily lead to a worse accident than the one it is supposed to prevent; or may actually cause one where none would have happened. There seems no reason to suppose that, with proper attention to the subject, the same thing could not be carried out in the United States. There are circumstances, indeed, in which a derail is useful in a passenger track. It should, however, not be a derail as it is ordinarly understood in America, but a proper catch siding with a reasonable degree of over-run.

T. S. LASCELLES

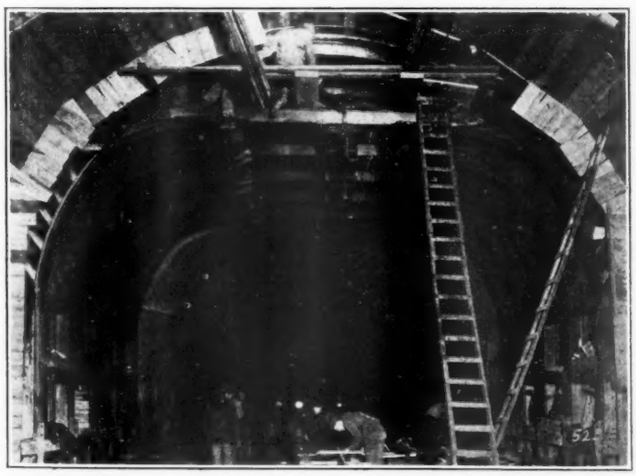


Portable Concrete Mixing and Placing Apparatus

Lining the Canadian Pacific's Five-Mile Tunnel

Highly Interesting Equipment and Method Furnish Effective Treatment of Huge Undertaking

THE CONNAUGHT tunnel of the Canadian Pacific is located on the main line at Glacier, B. C., about 420 miles east of Vancouver, where it pierces the Selkirk mountains and replaces the old high line over Rogers Pass. The old line had curvature amounting to about seven complete circles, long and heavy grades, a succession of snow-



Blaw Form Ready for Blowing. Completed Tunnel in Background

sheds aggregating about five miles in length and an elevation at the summit of about 4,300 ft. The tunnel reduces the summit elevation by about 500 ft., eliminates all of the curvature and snowsheds and reduces grades to one per cent against westbound traffic. In a country where the annual snowfall averages around 40 ft. in depth, the advantages arising from the existence of the tunnel are apparent without much study.

The tunnel itself is a double track-tangent five miles long. It was opened for traffic in December, 1916, after extraordinarily rapid construction made possible largely by the use of small pioneer tunnels. The later system consisted of small tunnels driven parallel to and 50 ft. distant from the line of the main tunnel with cross tunnels at intervals of 1,500 ft., from each of which headings were driven each way on the main tunnel line. Materials for the various headings and spoil from the main tunnel were handled effectively through the pioneer tunnels, as described in the *Railway Age* of December 11, 1914, page 1083.

When the tunnel was put into operation the construction had been carried only to the point of lining a limited portion, particularly that near the entrances, and of installing a powerful crude oil driven ventilating fan system at the west portal, it being the desire to realize the advantages of the work with the least delay. Meanwhile consideration was given to lining the balance of the tunnel, about 18,000 ft., in order to effect complete and permanent construction and to avoid any possible danger of falling rock. The south track of the tunnel was set apart for lining operations and except in this respect it was required that the lining work should interfere in no way with train movement.

The first consideration therefore was that of providing plant and equipment for installing a concrete lining extending over the entire side walls and tunnel arch and reinforced with steel, both longitudinally and at right angles to the tunnel section. It was estimated that approximately three cubic yards of concrete would be required per tunnel foot. At the same time all equipment was to be designed to provide an unobstructed passage for trains, minimize fire and other hazards, permit normal operation of signals and to furnish enough light and power in the working zones for rapid and economical construction.

Various combinations of air and electric apparatus were considered, both along the lines of entirely portable, self-contained plants, mounted on cars and of a stationary plant located outside of the tunnel. It was ultimately concluded that conditions would best be met by a stationary central electric plant located outside the tunnel, adapted to supply

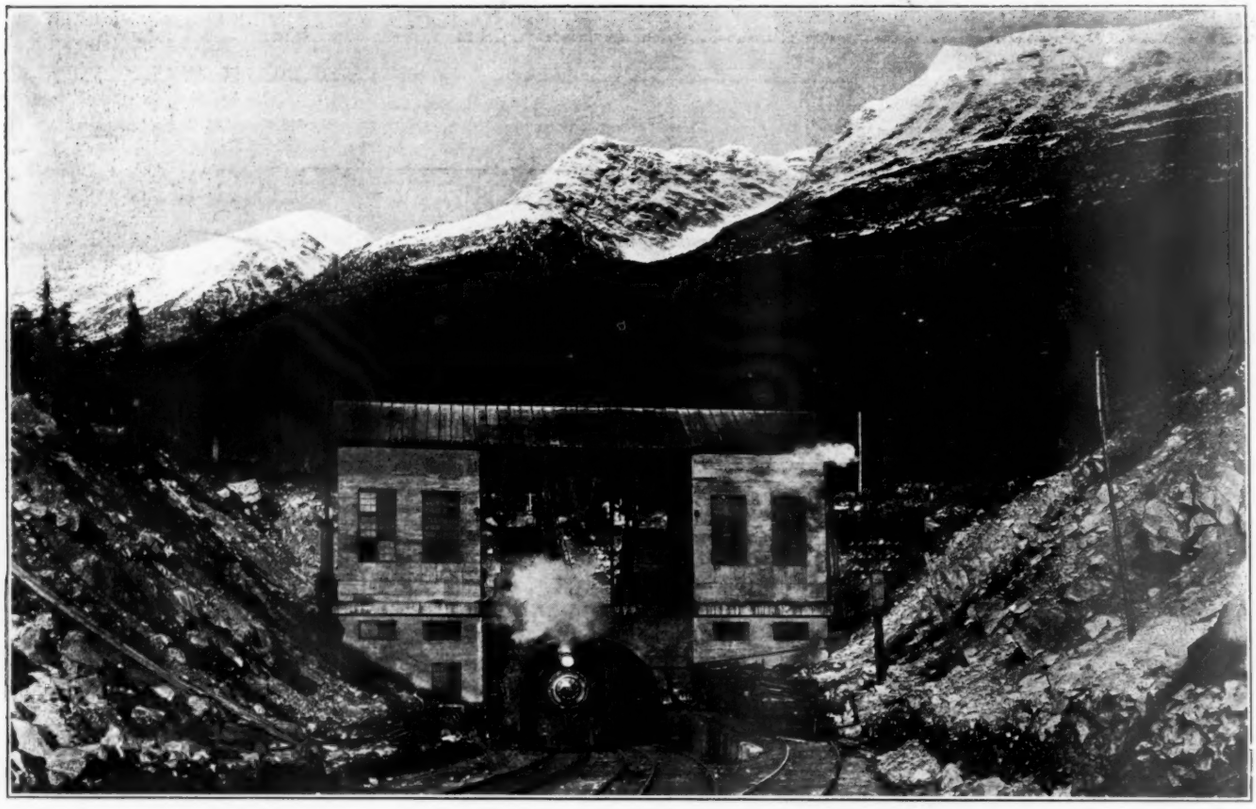
power to a portable concrete mixing and placing apparatus operating inside the tunnel.

Accordingly, a 300 kw. power house was located near the west portal, in which are employed locomotive type coal burning boilers equipped with the necessary breeching, individual stacks and blowers. Coal is delivered from standard coal cars running on an overhead trestle. Storage for several hundred tons of coal for use during the winter months is provided. Feed water for the boilers is obtained from a nearby mountain stream, the delivery being accomplished by gravity or, in an emergency, by pumps.

Two direct-connected units of 150 kw. capacity each deliver power through a simple switchboard from which the power is conducted in two three-phase circuits of 2,300 volts over a wooden pole line up to the entrance of the west pioneer tunnel. The power is then carried through the pioneer tunnel for about 9,000 ft. on bare wire. As the pioneer tunnels are entirely separated from the main tunnel they provide an ideal space for the stringing of these high tension lines and have made it possible to effect material savings over the cost of lead covered cables. From the last or sixth crosscut between the pioneer and main tunnel, the transmission line is carried in cable along the side of the main tunnel for about 3,600 ft. to the first working zone. Here the power is lowered by transformers set in niches in the side wall to 110 volts for light and 550 volts for power. This low tension distribution system is provided with outlets every 100 ft. to which the power and light apparatus can be attached readily.

After numerous experiments had been conducted in connection with the lighting of the working areas and particularly with a view to overcoming the effect of the smoke following the passage of trains, flood lights of 500 watts capacity each were installed. These lights are portable and can be arranged singly or in batteries as may be desired. A phase of the lighting problem equally important to that of providing adequate light in the presence of smoke was that of arranging the system so that the intensity of the light could be reduced as the smoke cleared away, thus avoiding the blinding effect of excessive light on the workmen. The lights have largely cut down the time which would otherwise be lost in waiting for smoke to clear. With approximately 125 men working, this loss of time would be a very considerable item.

The actual mixing and placing of concrete is accomplished by two 75-ton pit flat cars coupled together. On one car there is a 1,290 ft. motor-driven compressor, while on the other car is a motor-driven concrete mixer emptying into a pneumatic placer from which successive charges of concrete are shot by air under about 80 lb. pressure into the forms. These cars also carry sand and gravel, water and about 450 bags of cement. All storage of materials on the cars is calculated on a basis of blowing one complete form or 21 ft. 6 in. of completed tunnel without going outside the tunnel for recharging.



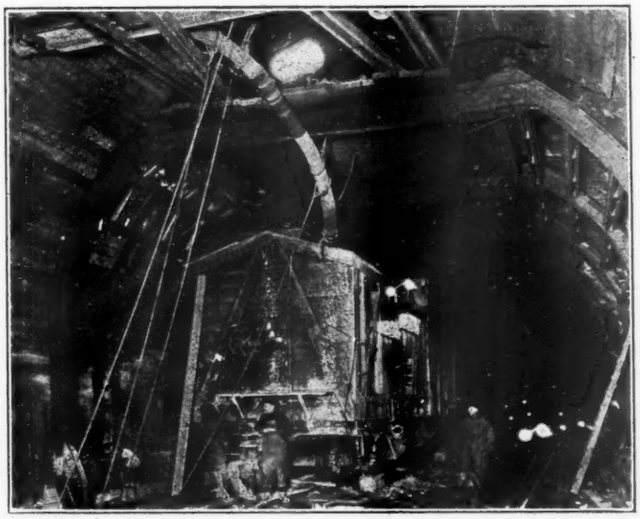
West Portal of Tunnel, Showing Fan House and Fans; Selkirks Mountains in the Background

In operation, the cars are spotted under the form to be blown, electrical connections made with the power line and flexible hose projected into the form, after which the power is turned on and mixing and blowing begun. A 200 hp. motor is used to drive the compressor but no difficulty has been encountered from vibration or rocking of the cars in spite of the large capacities of the apparatus placed upon them. A 27-ton gasoline locomotive is used to handle the cars in and out of the tunnel and to do a variety of switching of material cars from the main line to the various storage bins. This gas locomotive is supplemented at times by a steam locomotive, particularly during the winter under snow conditions.

The concrete is blown into collapsible steel forms, there being six of these units, each giving 21 ft. 6 in. of completed

tunnel at one setting. These units are set up, filled, collapsed and rolled forward to their new position in rotation, the schedule calling for one complete form to be blown every day. These forms clear all traffic. Each form is preceded by a so-called pioneer form, or movable platform, spanning both tracks from which all advance work is done, including a considerable amount of overhead work arising from roof scaling, the completing of false forms where the tunnel section is over-broken, the packing of the space behind these false forms with lagging and finally the placing of reinforcing preparatory to concreting.

Outside the tunnel a camp has been built, complete in all details, as the work is in the heart of the mountains and has to be entirely self-contained. Bungalows have been erected



View Showing Pioneer Form, also Mixing Apparatus Ready for Placing Concrete

for sleeping quarters, subdivided into units of four men each. Separate small houses have been built for the married men and there are also provided a community dining room, bath house and laundry, kitchen and storehouses—in all about 55 buildings. All quarters are electrically lighted and provided with water, and the camp includes a drainage system and a septic tank.

Near the power house there is a small motor-driven machine shop and blacksmith shop in addition to sheds for the storage of cement, reinforcing steel, lagging and lumber. These are particularly necessary on account of the heavy snowfall which buries everything deeply during the winter. A 5,000 yd. gravel bunker handling its material by gravity is also installed. Steam heat is provided to prevent the gravel from freezing.

This work is being done under the direction of W. A. James, assistant chief engineer; Frank Lee, engineer maintenance of way, and H. Rindal, district engineer of the Canadian Pacific, Mr. James having previously represented the railway on the ground as engineer of construction in charge of the driving of the tunnel. The Sydney E. Jenkins Company, Ltd., Winnipeg and Vancouver, is doing the construction work. We are indebted to the latter company for this article.

DAN SMITH, colored station porter of the Southern Railway at Wagener, S. C., aged 35, recently established a record for fast work by loading sixty 500-lb. barrels of rosin into a freight car in forty minutes. Each barrel was rolled from the platform into the car and placed on end.

Tentative Valuation of the Chicago, Rock Island & Pacific

WASHINGTON, D. C.

THE first tentative valuation report to be served by the Interstate Commerce Commission in the case of one of the larger railroad systems was made public on September 10, covering the Chicago, Rock Island & Pacific and its subsidiary and affiliated lines. The used property devoted to common carrier purposes is given a "final value" of $322,277,596 as of the valuation date, June 30, 1915. This represents a total main track mileage of 7,218 against which the company had issued securities which were outstanding in the hands of the public to the amount of $307,637,422. The property which is valued at $322,277,596 does not, however, include the affiliated Chicago, Rock Island & Gulf, 455 miles, which is given a final value of $13,212,667. While the fact that the commission has found a value greater than the amount of the securities held by the public may come as a surprise to those whose ideas of the Rock Island capitalization were based on the total of the securities issued by the railway company and its two holding companies which controlled the operating company, it is to be noted that the capitalization of the Chicago, Rock Island & Pacific *Railway* was not affected by that of the Chicago, Rock Island & Pacific Railroad Company of Iowa, which owned most of the railway stock, nor of that of the Rock Island Company of New Jersey that held the stock of the Iowa company. The report of the commission is as of a date while the railway company was in the receivership which preceded its reorganization and during which the holding companies were wiped out.

The total outstanding capitalization of the Chicago, Rock Island & Pacific Railway on June 30, 1915, is stated in the report as $377,395,738, of which $69,758,315 was held by or for the carrier and $307,637,422 was held by the public.

The commission, in its tentative valuation reports, does not show how its final value is made up. The report says that "after careful consideration of all the facts herein contained, including the excess cost of the carrier lands, appreciation, depreciation, going concern value, working capital, including material and supplies, and all other matters which appear to have a bearing upon the values here reported, the values, as that term is used in the Interstate Commerce Act, of the property of the carrier, owned and used, used but not owned, and owned but not used, devoted to common carrier purposes, are found to be as follows:"

The final value includes $251,809,983 for the property wholly owned and used, and $70,467,613 for the property used but not owned, leased from the Improvement Company, the Iowa Company, the White & Black River Valley, the Peoria & Bureau Valley, the Rock Island Memphis Terminal, the Stuttgart & Southern, the Rock Island & Dardanelle, the St. Paul & Kansas City Short Line, the Rock Island, Arkansas & Louisiana, the Choctaw, Oklahoma & Gulf, the Keokuk & Des Moines, and from other railroads and private parties. There is also property to the amount of $252,937 owned but leased to other companies, so that the final value of the total owned property, 5,355 miles, is given as $252,062,920.

It is stated that there is included in the value above stated as wholly owned and used the sum of $8,809,983 on account of working capital, including material and supplies. The total assets stated by the carrier on its general balance sheet on date of valuation were $318,215,217, and the investment in road and equipment, including land, was stated in the books of the carrier to be $235,867,019. The report gives a number of readjustments in this account but says it is impossible to state one sum, in terms of cash, as representing the carrier's investment in road and equipment.

As in most of the tentative valuations, the report says, the original cost to date of each piece of common-carrier property

cannot be ascertained, but that the recorded outlay for the property as a whole appears to have been approximately $207,445,244 in recorded money outlay and an outlay in securities of a par value of $26,486,003. These figures do not include certain expenditures made by predecessor companies.

The cost of reproduction new and the cost of reproduction less depreciation of the common carrier property other than land are given as follows:

	New	Less Depreciation
Wholly owned and used, including carrier's portion of jointly owned property	$254,164,621	$199,974,141
Total used	330,436,710	260,255.674
Total owned	254,200,169	199,992,235

The present value of carrier lands owned is given as $37,160,068 and the excess cost of acquisition as $29,927,514 and of the carrier lands used, $43,656,245 and the excess cost of acquisition $35,068,446. The carrier also owned non-carrier lands, which, with the improvements, are given a value of $4,156,056, and securities of other companies of a par value of $161,027,447 carried on the books at a value of $60,463,584.

The value of materials and supplies on hand was shown by the carrier's records to have been $5,605,310.

Separate figures are given for the various subsidiary companies whose property is used under lease, and whose values are included in that given for property used.

The Chicago, Rock Island & Gulf, which owns 456 miles of first main track, but uses only 455 miles, is not included under the figures for the Chicago, Rock Island & Pacific, although its stocks and bonds are held by the latter or its subsidiaries. The outstanding capital liabilities of the Gulf company were $17,248,372. Its investment in road and equipment was stated in its books at $17,374,563. The cost of reproduction new of the property used is given as $14,679,021 and the cost less depreciation as $11,735,613. The present value of carrier lands is given as $370,669 and the final value of the carrier property used as $13,212,667.

The carrier has 30 days in which to file a protest.

Freight Car Loading

WASHINGTON, D. C.

AN INCREASE of 892 in the number of cars loaded with revenue freight during the week ended September 3, compared with the previous week, is shown by reports received by the Car Service Division of the American Railway Association. The total for the week was 830,601 cars. This is the largest week's loading since December 11, 1920, and represents the fifth consecutive week of increase, but as compared with the corresponding week of 1920 it shows a loss of 131,032 cars.

The total number of cars loaded with merchandise and miscellaneous freight was 505,425, an increase of nearly 6,004 as compared with the week of August 27, but 30,000 less than for the corresponding week of last year.

Loading of grain and grain products was 60,632, an increase as compared with the week before of 1,127, but 18,000 cars more than for the same week of 1920. The loading of live stock amounted to 27,539 cars or a decrease of 1,531 under the preceding week and slightly less than for the corresponding week of 1920.

Coal loading amounted to 155,816, a decrease of 5,796 as compared with the week before, but 43,000 cars less than for the corresponding week of 1920. The loading of forest products was 45,419, a decrease of 1,059 over the week before, but about 17,000 cars less than the loading for the corresponding week of 1920. The ore loading was 31,112, an increase as compared with the previous week of 1,077, while the loading of coke was 4,658 cars, an increase of 48.

The number of surplus serviceable freight cars for the week ending August 31 was 246,440, a decrease of 23,584 cars as compared with the week before. This included 68,938 surplus box cars, a reduction of over 10,000 within a week and 130,596 surplus coal cars, a reduction of 6,385. Shortages were also reported from certain districts amounting, however, to only 739, of which 641 were box cars.

IF MONEY TALKS in America, it screams in Europe. And the secret of getting through a sojourn there at a moderate cost lies in judicious tipping. In England, for instance, before the war a railway porter was quite happy with a two-penny tip. But only "white money" goes in these days—nothing less than sixpence, and if a porter has to handle a trunk he will want more. The prevailing custom among guests of English and Continental hotels is to do the tipping in one operation on the day of departure. In the event of a prolonged stay, the servants expect to be remembered once a week. At a first-class English hotel you should count on at least a pound a week for regular tips, apportioned approximately as follows: porter, five shillings; chambermaid, five shillings; floor waiter, five shillings; boots, half a crown; bellhop, half a crown. In France you should give three francs at least where you would give two shillings in England. It must be borne in mind that in Europe it is safe to offer a tip to anybody short of a cabinet minister. In England, if you yearn for a comfortable compartment on a train look up the conductor and tell him so—say it with silver, and he will work wonders.

—Gordon Stiles in Leslie's.

REVENUE FREIGHT LOADED AND RECEIVED FROM CONNECTIONS

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. FOR WEEK ENDED SATURDAY, AUGUST 27, 1921

Districts:	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Merchandise L.C.L.	Miscellaneous	Total revenue freight loaded: This year 1921	Corresponding year 1920	Corresponding year 1919	Received from connections: This year 1921	Corresponding year 1920	Corresponding year 1919
Eastern	1921	7,527	3,086	44,749	1,112	4,586	2,068	59,762	81,702	204,592	.....	.....	205,627	.....	.....
	1920	7,905	2,714	57,147	3,540	8,059	11,031	48,384	106,155	.....	244,935	233,827	.....	273,719	252,530
Allegenhy	1921	3,522	3,047	44,645	2,268	2,630	7,230	44,837	57,055	165,234	.....	.....	112,717	.....	.....
	1920	3,174	3,666	66,033	7,827	3,869	13,847	39,483	74,436	.....	212,335	206,804	.....	153,278	149,154
Pocahontas	1921	173	198	16,911	33	1,237	.....	2,685	5,400	26,637	.....	.....	13,077	.....	.....
	1920	251	272	23,769	749	1,727	228	3,186	6,140	.....	36,322	36,697	.....	20,820	18,237
Southern	1921	3,526	1,747	22,265	283	14,180	183	36,231	31,723	110,138	.....	.....	61,045	.....	.....
	1920	3,352	1,808	24,318	1,622	19,097	2,800	35,266	41,162	.....	129,425	120,145	.....	75,410	67,842
Northwestern	1921	19,468	7,242	9,350	484	10,794	19,012	28,440	35,162	129,952	.....	.....	49,777	.....	.....
	1920	13,657	7,179	12,291	1,701	17,711	46,172	30,360	41,415	.....	170,486	166,848	.....	63,093	65,300
Central Western	1921	19,253	9,953	18,682	196	6,315	831	31,195	42,134	128,553	.....	.....	51,670	.....	.....
	1920	13,209	10,506	21,996	361	7,839	4,936	32,756	47,521	.....	139,124	125,830	.....	68,973	67,946
Southwestern	1921	6,036	2,797	5,010	236	6,718	711	16,015	27,080	64,603	.....	.....	46,402	.....	.....
	1920	4,496	2,318	6,212	121	8,278	695	17,767	28,794	.....	68,681	61,502	.....	51,504	50,126
Toal all roads	1921	59,505	28,070	161,612	4,606	46,460	30,035	219,165	280,256	829,709	.....	.....	540,315	.....	.....
	1920	46,044	28,463	211,766	15,921	66,580	79,709	207,202	345.623	.....	1,001,308	.....	.....	706,797	.....
	1919	52,699	35,567	194,606	11,153	61,647	64,689	143,468	387,824	.....	.....	951,653	.....	.....	671,135
Increase compared	1920	13,461	.....	.....	.....	.....	.....	11,963	.....	.....	.....	.....	.....	.....	.....
Decrease compared	1920	.....	393	50,154	11,315	20,120	49,674	.....	65,367	171,599	.....	.....	166,482	.....	.....
Increase compared	1919	6,806	.....	.....	.....	.....	.....	75,697	.....	.....	.....	.....	.....	.....	.....
Decrease compared	1919	.....	7,497	32,994	6,547	15,187	34,654	.....	107.568	121,944	.....	.....	130.820	.....	.....
August 20	1921	59,875	29,110	154,140	4,436	44.583	32,370	216,752	275,170	816.436	968,103	913,207	540,408	692,847	620,725
August 13	1921	61,560	26,835	158,260	4,286	45.333	32,942	213,046	266,703	808,965	971,269	832,439	530,550	687,614	588,131
August 6	1921	58,622	26,610	147,273	4,218	43,460	32,058	209,236	263,204	784.781	935,730	*872,073	522,247	686,317	596,917
July 30	1921	66,416	25.358	151,089	4,111	44,712	30,103	210,367	264,414	796,570	936,366	*925,195	520,201	694,788	648,690

*Detail figures for 1919 for Michigan Central not given.

Post Office Seeks to Co-operate With Railroads

Evidences of Changed Attitude on the Part of the Department Under New Administration

WASHINGTON, D. C.

A NEW POLICY in the Post Office Department governing its relation with the railroads has been made evident since the change in the office of postmaster general which took place on March 4. Not only is the new postmaster general, Will H. Hays, a man of a different type from his predecessor, A. S. Burleson, but he announced at the outset that he proposed to select an experienced railroad man for the office of second assistant postmaster general in charge of the railway mail service. Col. E. H. Shaughnessy, of the Chicago & North Western and later with the Transportation Corps of the A. E. F., was appointed to succeed Otto Praeger, who was formerly a newspaper man.

One of the first steps taken by Col. Shaughnessy was an effort to create an atmosphere of harmony and co-operation between the department and the railroads in the furnishing of mail service to the public. For many years there had been a series of controversies between the roads and the department. Not only was the latter constantly endeavoring to reduce the compensation paid to the railroads, which they had been contending was already too low, but there was a constant succession of disputes as to the interpretation of the postal laws and regulations regarding both service and compensation, which are so voluminous and complex as to afford a wide opportunity for controversy over technical points.

The big question of rates for the transportation of mails by railroad had been settled by the Interstate Commerce Commission in its decision in the mail pay case in January, 1920, which resulted in a large increase in the rates, but this decision still left open a considerable number of questions of interpretation.

With a view to placing the relations between the department and the railroads on a new basis, Col. Shaughnessy on April 13 wrote to Ralph Peters, chairman of the committee on railway mail pay, inviting his committee to meet with representatives of the department to discuss the question of making the biennial test to determine the number of sacks of mail and outside parcels that would be considered as equivalent to the three-foot unit of space, and such other questions as they might care to bring before the department for consideration. Representatives of the American Short Line Association and the American Electric Railway Association were also invited and participated in the conference.

The first meeting was held on May 2 and the proposed arrangement for making a test being quickly disposed of, the railroad committee asked for a postponement of about 30 days to make the necessary preparation in connection with questions they desired to submit. Another meeting was held on June 6, at which the railroad committee through a sub-committee presented a docket of 18 subjects which they desired to discuss. The items were fully discussed in frequent meetings following that date, the sub-committee calling in various railroad representatives to assist.

Tentative understandings were arrived at and when the docket had been completely covered Col. Shaughnessy requested that the ideas set forth by the sub-committee be reduced to definite written requests to which replies could be made, thus properly laying the foundation upon which to build for future reference and guidance. After the time necessary for consideration the replies of the department were given in written form as an agreement of principles in the outlining of policy, the necessary administrative orders to follow in due course. In a large number of the cases agreements were readily reached on a compromise basis and in others it was agreed to present joint petitions to the Interstate Commerce Commission for decision.

Following these conferences with the officers designated by the railroads to handle railway mail matters, Col. Shaughnessy sent a report of the conferences and of the questions and replies to the railroad executives, saying he thought the matter was important enough to be given serious consideration by the railroad organizations. He said in the letter that while the subjects treated were perhaps in themselves not of great consequence, he thought the idea of getting together and arriving at mutually satisfactory understandings, especially to the extent of presenting joint petitions to the Interstate Commerce Commission, was of great importance to every one concerned, marking the first step in a really constructive program. He said that a serious effort was being made in the department to avoid controversial technicalities and that he would like to bespeak a like attitude on the part of the railroads, feeling that the department and the railroads are dependent upon each other and must work harmoniously if they are to provide the right sort of mail service to the public. It was also suggested that it might be well for the roads to go over the mail situation with their operating organizations.

Col. Shaughnessy has received letters from the railroad executives expressing a hearty appreciation of the attitude taken by the department and expressing a willingness to meet it half-way. The idea of holding joint conferences for the purpose of settling questions in dispute as promptly as possible was especially appreciated and many of the letters commended the businesslike attitude of the department in this respect.

Col. Shaughnessy has just issued a decision in one of the important cases which was discussed at the conferences, which had been a source of controversy since September 1, 1920. This involved the question as to whether the department or the railroads should bear the expense of handling mail between the Union Station in St. Louis and the St. Louis city post office, which is located across the street from the railroad station, but is connected with it by a subway built under the street by the government, which is under the direction and control of the Post Office Department. For several years the railroads have delivered the mail at the entrance to the subway and the messenger, who trucked it through the subway into the post office building, was paid by the Post Office Department $42,000 a year.

The Interstate Commerce Commission held that the railroads were required to perform this kind of messenger service free only when the post office was "contiguous." In 1920 Second Assistant Postmaster General Praeger issued a ruling that in this case the post office was contiguous and that after September 1 the expense of trucking the mails through the subway should be borne by the railroads. The railroads protested on the ground that by delivering the mail from trains to the entrance to the subway they were delivering them to the post office property. There was a large sign at the entrance to the subway "For Post Office Employees Only." However, the amount of the messenger expense was thereafter deducted each month from the pay of the 16 railroads involved and the railroads protested each month against the deduction.

Col. Shaughnessy suggested that any legal steps be postponed until he had an opportunity to examine the case, and, after a very careful consideration of the facts he has now

decided that the Post Office Department should take over the mail messenger service between the sub-basement of the post office and the Union Station via the subway, reverting to the practice in effect prior to September 1, 1920, and that refund should be made to the railroad companies of all deductions made since that date for the service.

One of the subjects discussed at the joint conferences was the standardization of mail cars. President Aishton, of the American Railway Association, has appointed a committee of motive power officers, consisting of J. T. Wallis, H. L. Ingersoll, C. E. Chambers and G. H. Emerson, to confer with representatives of the department regarding the standardization of R. P. O. and apartment cars to conform to the latest plans of the department.

One of the questions discussed has arisen from the decision of the commission stating space rates of pay for "separately operated" railroads. The commission has given a definition of the term "separately operated" which has been construed by the comptroller of the Treasury in a manner which the railroads consider out of harmony with the intent of the commission. It appears to be the view of the comptroller of the Treasury that if the officers of a controlling and a subsidiary line are the same, such a situation prevents the subsidiary line from being a separately operated road, while the railroads consider that a road which publishes separate tariffs in its own name and files separate reports with the commission is a separately operated road, although the officers may be the same as the officers of the controlling company. The department agreed to re-submit this question to the comptroller of the Treasury for a review.

Another question arose as to changes in authorizations by the Post Office Department en route at points where it is not practicable for the railroads to make a change in cars. In many instances the railroad committee said the points had been selected by the department on technical rather than practical grounds. The reply was that the department would accept railway passenger and freight division points to be established division terminals.

Announcement has been made by the postmaster general that after October 1 the former practice of shipping periodical mail in mail cars instead of by freight will be restored. The change will expedite the delivery of this kind of mail. The practice of sending such mail by freight was adopted by the former post office administration in order to reduce expense at a time when the railroads were compensated for the transportation of mails on a weight basis. The basis of compensation now is the amount of space authorized to be used in cars and where the authorization exceeds the usual volume of mail it will be possible to carry magazines that formerly went by freight without additional expense.

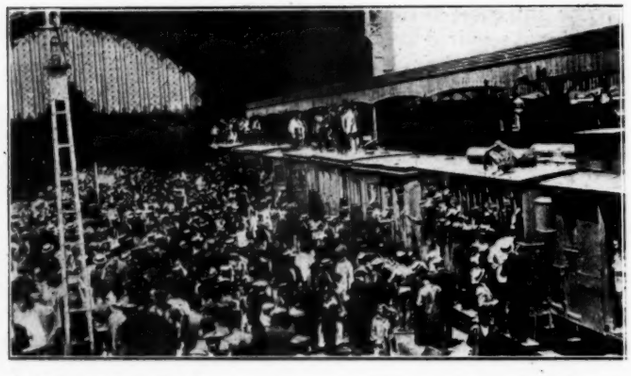


Photo by International

Spanish Troops Leaving Melilla, Spain, for the War in Morroco

Railroad Administration Begins Sale of Equipment Trusts

WASHINGTON, D. C.

THE DIRECTOR GENERAL of railroads announced on September 12 that he had, with the approval of the President, confirmed the sale, at par plus accrued interest, of $7,500,000 par value of the railroad equipment trust certificates now held by the government. The purchasers are Messrs. Kuhn, Loeb & Co. The offer for the purchase of these securities was received from Messrs. Kuhn, Loeb & Co. by Eugene Meyer, Jr., managing director of the War Finance Corporation, and transmitted by him to the director general of railroads.

The equipment trust certificates bear interest at 6 per cent and mature serially from 1928 to 1935, inclusive. The securities sold are of the following railroad companies:

Atchison, Topeka & Santa Fe	$1,500,000
Central Railroad of New Jersey	1,500,000
Chicago, Burlington & Quincy	1,500,000
Norfolk & Western Railroad	1,500,000
Southern Pacific	1,500,000

The Railroad Administration holds about $381,000,000 of these certificates given by the railroads in payment for the cars and locomotives ordered by the Railroad Administration in 1918 and allocated to the various railroad companies. Under the plan proposed by the President for settling the accounts between the railroads and the government, it was proposed to authorize the War Finance Corporation to purchase these certificates as well as additional securities which would be given by the railroads to the Railroad Administration in connection with the funding of additions and betterments other than equipment made by the Railroad Administration during the period of federal control. It was the expectation that the War Finance Corporation could place cash with which to settle with the railroads at the disposal of the Railroad Administration by selling its own obligations pending the time when it would be possible for it to sell the railroad securities in the open market.

The bill authorizing the War Finance Corporation to itself acquire these securities has been passed by the House of Representatives, but is still pending in the Senate. Meanwhile the sale of some of the certificates is understood to represent a test of the market and a sort of public demonstration that the railroad securities held by the government will be salable as the market improves. Under the law the Railroad Administration cannot sell the certificates for less than par and accrued interest and it is understood that it does not consider that the certificates issued by some of the roads can be sold on that basis at the present time, but it is hoped to be able to sell possibly $200,000,000 worth. These which were sold were issued by some of the railroads whose credit is of the highest and it is expected to be able gradually to market an additional amount of these securities. It has been officially stated that the government has received several offers for the car trust certificates, but it was not stated at what prices or for what amounts the offers had been made. The funds received by the Railroad Administration will increase the amount it will have available to make settlements.

The railroad situation was the subject of a conference on September 8 between President Harding and Alfred P. Thom, general counsel for the Association of Railway Executives, who said he had called upon the President to emphasize the necessity for early financial assistance to the carriers.

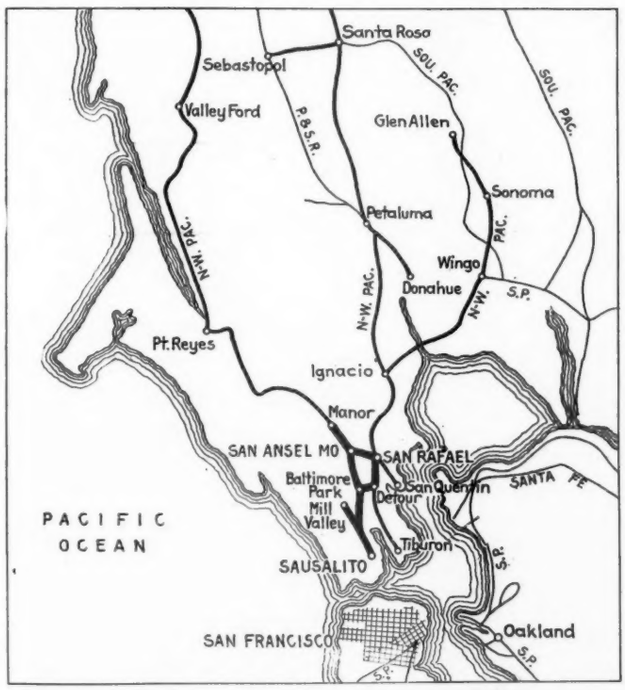
THE PROVINCIAL GOVERNMENT of Manitoba has been asked to finance the construction of a railroad to extend from The Pas to the mining district in the northern part of that province in order that the natural resources of that section may be developed.

Northwestern Pacific's Experience With Third-Rail*

Five Men Maintain 37 Miles of Contact System at an Annual Cost of From $87 to $145 Per Mile

OUR ENTIRE operation is over a private right-of-way, and therefore we will not enter into any lengthy discussion as to why the third-rail system was chosen instead of the overhead trolley. Those of us who today (after 18 years of service) have the responsibility for the up-keep of this system go to bed nights, yes stormy, windy nights, too, and sleep just as soundly as those men did who first installed it. Could you say the same for a man on a trolley system? I am afraid not.

The present system consists of six miles of single-track and 15½ miles of double-track, or a total of 37 miles of electrified



Map of Southern Part of Northwestern Pacific, Showing Electrified Sections

track. All stations carry 600 volts at the switchboard and that statement establishes our layout as a 600-volt system.

The over-running contact rail as used on the Northwestern Pacific is all regular common "T" rail and nearly all of it is either 60-lb. steel or 50-lb. iron. As an electrical conductor these two kinds of rail are considered equal, and for practical calculations are equal in conductivity of 600,000 circular mil copper, nearly three times the ordinary trolley.

In the first installation the rail was supported mainly on a large block of wood spiked to the tie and the contact rail was spiked to the block. These were continually breaking off and did not last very long. Then some patent granite blocks were tried. These were put in at the Sausalito terminal and through the Corte Madera tunnel. The leakage over them was excessive and the aura at night was at times brilliant. It was decided that the object to be obtained was a support for the contact rail and not a means of illumination. The granite blocks therefore found their way out.

*Abstract of a paper read at the Pacific Railway Club's fifth annual electrical night by C. E. Hatch, electrical engineer at San Francisco, August 11, 1921.

At that time the present style of support block was designed and put into service and our troubles were nearly over. This type block has proven very satisfactory so far as the Northwestern Pacific lines are concerned. Every sixth tie in the track is one foot longer than the standard tie. On this extra length the support for the contact rail is placed. This support consists of a redwood block 5 in. square and 6½ in. or 7 in. long. The length depends on the size of rail in track. This block is treated with two coats of insulating paint by dipping. There is a ⅜ in. through bolt at the base holding to small angle irons which in turn are lagged to the tie. On top of the block is placed a cast-iron cap upon which the rail rests. The cap is so constructed as to form an apron over the block and give a space of nearly 2 in. on the block that is always dry even in the worst rain storms. This cast-iron cap has a channel in which the rail rests, the channel running parallel with the track. The rail is not clamped or fastened to the block in any way, but is free to move with the expansion and contraction.

One of the questions that probably comes to the minds of some is that this is not adequate and the contact rail should be held down. I am free to admit that we have had the contact rail try to crawl all over the right-of-way at times, but it generally landed on the running rail and the result was fireworks and a shut-down. When this buckling has occurred

Soldering Bonds on the Running Rail. Third Rail Is Shown in Foreground

it is simply a case of breaking a joint, allowing the rail to straighten out and dropping the overlapped ends to allow safe travel of the collecting shoe on cars. This has always happened during the warm hours of the day and by morning the men could go out and place the rails back on the blocks and bolt them together. To overcome this trouble, about twice a year men go over the line and hammer the joints and pour oil around the angle bars and over a large proportion of the support block caps. When this has been properly done, the buckling feature has been eliminated. As an illustration of how successful this is, we have several sections of 3,000 ft. and one section of over 4,000 ft. of continuous run of power rail.

At road crossings and intervals in front of stations, the rail

is opened and the ends protected by approach blocks. These blocks are pieces of rail equal in cross-section to the contact rail, but with one end heated and hammered, thus allowing the contact shoes on the cars to ride up onto the rail easily. At these openings there is constructed an underground box with at least one 1,000,000 circular mil cable in it, the ends of which are soldered to the ends of the contact rail, thereby making the continuous circuit.

These undergrounds, as we call them, are constructed of one inch redwood and are made four inches square inside. The cable is supported in the box, clear of the wood by porcelain cleats every two feet. The box is then filled with an asphaltum insulating pitch. The pitch is heated and is poured slowly to avoid blow holes and the cover of the box is nailed on while the pitch is still hot. Properly installed this type of box has proved very satisfactory and has the most excellent moisture resisting qualities. Many of these boxes after years of service have had the cables disconnected and careful tests showed not the slightest leak.

In the original installation there was used a feeder placed in the web of the rail from Sausalito to San Anselmo with the exception of the section through the Corte Madera tunnel. This feeder was a 1⅜ in. aluminum rod in 30 ft. lengths, but it proved unsatisfactory. We now have good connections to the rail and a good joint in our feeder every 1,000 ft. where before we had a poor joint every 30 ft.

One great advantage in the third-rail construction, both mechanically and financially, is our method of carrying feeders. From Sausalito to Alto power house, a distance of 4½ miles, we have two one million circular mil cables on each rail, or four cables in all and the only additional expense for feeder support is the small iron clamp used to hold the cable in the web of the rail. There are at advantageous points switches so that the system can be sectionalized if necessary and in case of trouble one section be eliminated entirely. We also carry an overhead jumper on pole line over Corte Madera tunnel, and have switches installed so that the tunnel section alone can be cut out without interference with any other section.

At the stations in the double-track territory, there used to be a platform over both power rails. These center platforms have now all been discarded and platforms constructed on the outside. As a protection in lieu of the center platform there is placed a wooden guard over the power rail and a fence between them. This wooden guard is a piece of 2 in. × 8 in. pine fastened to and supported by the power rail itself. This guard rail is used also in yards and other places where employees and others are liable to stumble over the power rail.

The use of a third rail system, of course, can only be justified where, like the Northwestern Pacific, the operations are entirely over private right-of-way. There have been several cases where people struck by train have been thrown against the power rail and burned. There is but one case of human life lost that I can find, directly traceable to contact with the third rail.

There can be naturally not much argument as to maintenance between the overhead trolley and the third rail system. It will probably sound rather fishy to some trolley men to hear that for the past ten years our regular third rail maintenance crew has not exceeded at any time five men. And these five men also find time to do part of the construction work of what extensions have been made during that time.

Our maintenance costs after 13 years of service show the following averages:

For 1916	$87.00	per mile
1917	95.00	per mile
1918	145.00	per mile

The differences in these costs do not reflect any change in the condition of the rails, but rather a decided change in labor and material cost. At present we are maintaining the entire system with a crew of five men, three of whom only devote one half day to power rail work. This crew also does all track bonding.

The costs previously given take care of all track bonding. All joints on the running rail are bonded with a 300,000 circular mil soldered bond with a "T" head, soldered directly to the rail. We admit that we are without doubt cranks on solder. All joints of whatever nature, bonds, feeder cable, cross cables, are soldered direct to the rail, using half and half solder. Our results from this operation are entirely satisfactory and we make in our cable connections but one joint, where, on the other hand, with the lug method there are two joints, one where the cable is soldered into the lug and another where the lug is bolted to the rail. This method, moreover, gives a much better electrical connection between rail and copper cable.

The gage of our rail is 26½ in. out from the gage line of track and top of power rail 6 in. above top of running rail. For total clearance we ask 12 in. above top of running rail, 22 in. out or more.

One of the main difficulties is in the winter from high water. Several times at certain points the water was up over the power rail, but it was fresh water and we were able to keep power on the rail and keep trains moving. When the extreme high tides come in the winter along the shores of Richardson bay with a good southwester behind them and the salt water begins to get up around the power rail, why, then we quit. This was particularly bad during one storm in the winter 1918-1919, and our traffic out of Sausalito was stopped for about three hours.

Short Line Association to Hold Regional Meetings

WASHINGTON, D. C.

OFFICERS of the American Short Line Railroad Association are planning to leave Washington shortly for a trip of nearly a month to cover the country generally for a series of regional meetings with the officers of short line roads in various parts of the country for discussion of the present railroad situation as it affects both the short lines and the trunk lines, in an effort to bring about a more general understanding of the situation and to formulate plans for meeting it. The list of subjects to be discussed includes rates as they affect the movement of traffic and the short lines; divisions of interline rates, whether they are generally just and reasonable as between strong and weak roads; labor; valuations and consolidation; settlements with the government; the consolidated purchasing agency for short line railroads; the issuance of securities; Section 10 of the Clayton act; effect of automobile transportation on the railroads; authority of the Interstate Commerce Commission over new construction and abandonment of existing roads, and new legislation.

The officers of the association, who will make the trip in an official car so that they may take with them many of their office files, will include Bird M. Robinson, president; Ben B. Cain, vice-president and general counsel; T. F. Whittelsey, secretary-treasurer; F. C. Reilly, traffic manager, Western classification territory; J. W. Cain, manager of purchases; I. T. Hanson, manager tariff bureau, and in addition, members of the executive board will join the meetings at various points. The itinerary covers the following meeting dates: Chicago, October 4; St. Louis, October 5; Kansas City, October 6; Denver, October 8; Salt Lake City, October 10; Portland, Oregon, October 12; Seattle, October 13; San Francisco, October 17; Los Angeles, October 18; Houston, Texas, October 24; New Orleans, October 25; Atlanta, Georgia, October 27.

Informal Meeting of Traveling Engineers

Hiring of Firemen, Conservation of Supplies and Operation of Locomotive Devices Discussed

THE TRAVELING ENGINEERS' ASSOCIATION held an informal meeting on September 7 and 8, 1921, at the Hotel Sherman, Chicago. At this meeting, which took the place of the regular annual convention of the association, postponed on account of prevailing business conditions, the reports of a number of the committees which were to have been presented before the regular convention were read and discussed and officers were elected for the ensuing year.

In calling the meeting to order the president, W. E. Preston, Southern Railway, spoke in part as follows:

President Preston's Address

Have you watched the sea in a great storm and noted the waves, mountain high, as they dash against the shore? And have you noted that for hours after the storm has passed and the sky is clear and the wind has ceased to blow, the waves still roll quite as high? The storm has passed, but the effects of the storm still remain.

For four years 40,000,000 men quit peaceful occupations and undertook to destroy each other, together with all the property they could reach. For those who did not go to war was assigned the great task of feeding and clothing those who fought and supplying the implements of warfare. No one has yet even guessed the cost of the conflict. We know that millions of lives were lost, and that the accumulated savings of centuries of industry were wiped away. The conflict is past, but we are left with waves of unrest, with our social and industrial life impaired, with the wreckage of a great storm to clear away.

Civilization is expensive. It costs effort and economy to create the wealth that will support modern life. The world problem is to replace that which was destroyed, that the comfort and security of civilization may be passed on to future generations. There is but one way to meet this cost. That which was destroyed was the product of labor of hands and brains, and was saved through centuries of economy. It is our task to work and save, simple virtues, but real wealth is only created when men work and save.

The contribution of the members of the Traveling Engineers' Association is to supply at minimum cost an article which the modern world stands in great need of—transportation. The world is far short of its demands. Ocean transportation was nearly swept from the seas by the great war. Transportation by highways is growing by leaps and bounds, but will never replace the service that was rendered by the railroads. During the past ten years our population has increased more than 15 per cent, but from the day the world was plunged into war the railroads have been unable to increase terminals, to better their road beds or to improve rolling stock. Members of our organization occupy key positions in supplying this sorely needed commodity—transportation. We are always on the firing line, in the front line trenches. But back of us is a great army of loyal engineers and firemen, trained for their jobs, strong, ready, capable.

The great world need is that men in all walks of life shall work harder and save more of what they produce. The world needs that every locomotive shall work to its full capacity the maximum number of hours each year, at the minimum cost of operation. Not alone for this year, but for years to come, must we contribute our big share to replace what has been destroyed.

Now is the time to stick close to the rigid rules of common honesty, to remember the ten commandments and keep them. The honest man will not accept a day's pay until he has done a day's work. There must be the same honesty in dealing with the corporation as with the individual. The world needs the spirit of Christianity permeating the lives and actions of men. The measure of a man must be not how how much wealth has he taken into his own safety vaults, but how much has he done in his generation to quiet the unrest, to put right the wrong, to house and feed and give comfort to a world whose civilization has been strained near the breaking point.

The world looks to us in America to safeguard the sacred right of man to own property, secure against all interference except by due process of law. It is the law that makes us free. Can you picture a railroad whose trains ran at random, at the mere whim of the engineer, who might claim that because this is a free country he had the liberty to run his train how, when and where he pleased? It is because he and all engineers obey the law that he becomes a free man. He has the freedom of the road when all obey the law.

New Officers Elected

The report of the secretary showed a membership of 1,546, representing a gain of 87 members during the year. The following officers were elected: President, J. H. DeSalis, New York Central; first vice-president, Frederick Kerby, B. & O.; second vice-president, T. F. Howley, Erie; third vice-president, W. J. Fee, Grand Trunk; fourth vice-president, J. N. Clark, Southern Pacific; fifth vice-president, J. B. Hurley, Wabash; secretary, W. O. Thompson, New York Central, and treasurer, David Meadows, Michigan Central. No change was made in the membership of the executive committee except the addition of W. E. Preston, Southern, the retiring president.

Abstracts of two of the reports and discussions follow. Others will appear in later issues.

Conservation of Supplies and in Operation of Locomotive Appurtenances

The subject of the conservation of supplies is logically divided into two parts; First, the conservation at the terminal, and second, conservation on the road.

A suitable building located at the point where all engines arrive and depart, materially affects the conservation of supplies at the terminal. This is where all equipment is kept to supply engines for service. The equipment is checked to the engine crews prior to their departure, and checked in again upon their arrival. This facilitates the keeping of a complete record at all times and enables the party in charge of equipment to account for it if any should be lost or destroyed. If the engine crews know they will be held responsible for the use of supplies upon their arrival at terminals, it will act as an incentive for them to take better care of the equipment.

Where the engines are in pool service, the engineer going out should have an opportunity of seeing the work reported by the incoming engineer. This will give the outgoing man the information that is essential for the proper care of any work that has been done. He will also have a knowledge

of defects that have been reported, which the shop forces were unable to attend to and he will thus be able to protect himself and the company from injury.

The adequate supply of lubricant for the trip should be considered highly essential to the conservation of machinery and appurtenances on the engine. Worn cylinders and valve bushings can often be charged to improper lubrication. However, this is seldom due to the fact that an insufficient amount of oil has been furnished. It is more often caused by defects that have not been reported or defects that have been reported and repairs not made. Also, instructions are not always carefully followed as to the right method of lubricating the machine, or perhaps the man in charge is indifferent.

In order to conserve supplies on the road it is imperative that engines be equipped with proper receptacles so that the different articles, such as oil, waste, lanterns, flags, water glasses, fuses and torpedoes, will not be wasted and damaged if not used. If all concerned were advised as to the cost of supplies or the enormous amount of money involved, it would be an incentive to all concerned for their judicious use and care. The co-operation of the employees is paramount. Carry no equipment on the engine that is not required. All surplus equipment should be promptly reported and removed at the home terminal.

Overloaded tenders are dangerous and extravagant, and overflowing tanks at water plugs are wasteful and expensive, for in freezing weather the water often overflows the tracks, which is very dangerous indeed, as well as expensive to clear away.

Enginemen should make intelligent reports as to locomotive conditions; that is, reports by means of which the enginehouse organization is capable of locating the precise defects. Reporting defects in a general way should not be tolerated, and enginemen should be encouraged to make proper reports by having the work done promptly or if the work cannot be done on this trip the engineman should be so advised and the work followed up and done for the next trip. This will encourage enginemen not to grow lax in making detailed reports.

Power Reverse Gears

We wish to note particularly the air losses of the power reverse gear. In many instances adequate forces have not been furnished to maintain this appliance and there are heavy air losses as a result of improper care. With the necessary care this device would result in a saving of fuel and water, as the engineer can adjust the cut-off with so much less exertion. However, with heavy air losses around the rotary and by the cylinder packing, it is next to impossible to regulate the cut-off at short valve travel, which results in the engine being worked at a longer cut-off, with a corresponding excess of consumption of fuel.

Once the steam has been used instead of the air for operating the gear it is of no more use until the piston is repacked.

Piston packing rings improperly cut, and failing to lap properly cause creeping. Also, if they are too tight and hardened, the rubber having lost its resiliency they will not keep tight contact with the cylinder wall.

Hardened packing in the piston gland, scored rod or worn parts—any blow here will cause creeping.

Leaky drain cocks or cylinder oil cups will cause creeping.

On some gears there are cone-shaped valves for the distribution of air to the power reverse and these valves cause considerable trouble because of leaks, which will cause creeping when the reverse lever is hooked up. Leaky rotary valve will also cause this trouble; however, this seldom gives any trouble. Cases have been found where the stop pin is broken off and wedged between the rotary faces, damaging them; but under ordinary wear the rotary stands up well.

When the reverse gear valve assembly is changed, it is absolutely necessary to check the length of the long connection rod to the cylinder lapping lever. In some cases it had to be changed in length as much as 1½ in. Failing to do this the links will touch bottom at one end and have too short maximum cut-off in the other end.

Lost motion in pins and connecting rods of the reverse should not be tolerated.

Owing to the fact that the gear receives most of its wear in hooked-up position, in time the cylinder increases in diameter at that part of the stroke and the piston rod decreases in diameter at the corresponding place. A gear that is worn this way will be a constant source of trouble from creeping and jumping.

Rotary, cylinder and connecting rod pins should be well oiled. Make sure that the steam shut-off valve is not leaking condensation into the reverse.

Cases have been found where the long connecting rod had several bends in it. This rod should be of sufficient size to avoid bending.

Locomotive Headlight Equipment

Any engineer operating locomotives equipped with electric headlights should make this a part of his study, in connection with his other duties. He should see before leaving the terminal that the dynamo has been well oiled and cared for and that his headlight is equipped with incandescent globes, also that he has sufficient lights placed in proper position in the cab, in order to furnish light to all the equipment he has to handle. He should bear in mind that the dynamo is the most vital part of the equipment and that he should pay particular attention to the condition of this machine at all times, keeping constantly in mind that all the bearings should be kept oiled. The governor will get out of order once in a while and will not control the speed of the machine as it should. When this condition develops, if the engineer does not take notice, it will result in the cab lights being burned out, especially if the headlight is cut out from the switch in the cab. In order to handle this situation, the engineer should throttle the machine down by the throttle in the cab. The engineer should bear in mind that if his hours are long in making the run over the division, at night, the machine should be lubricated between terminals. He should also see that his headlight is properly focused. There is no one who has a better opportunity of keeping the headlight properly focused than the engineer. After completing the trip, if there are any conditions about this equipment causing it not to function properly, he should make an intelligent report and have conditions properly cared for at the terminal before the engine is allowed to go out again.

The Superheater

Enginemen should be taught the disastrous effects of carrying high water with this device. It not only converts the appliance into a steam dryer, but is very apt to cause the unit joints to leak and also to form a coat of lime or sediment on the inside of the tube, which substantially affects the degree of superheat obtained. It has been discovered that in extreme cases of carrying water too high in the boiler the superheat units have become completely clogged. Moreover, superheater headers have been broken, due to an excessive amount of water or filling the boiler too full while the engine was laying up at terminals.

Enginemen should receive instructions to closely observe the operation of the damper, for if the damper does not close when the throttle is closed, the superheater units will become overheated and will not only cause the unit joints to leak, but will have a tendency to crack the return bends and thus cause a complete engine failure.

The committee deems it best to place an independent lubricator on the locomotive for the purpose of lubricating the

stoker engine or motor, placing it convenient to the fireman. We do not wish to relieve the engineer of the responsibility of caring for this machine when on the line of road, but the fireman should be held responsible by the engineer for the proper care of this machine. It will in a measure fit him for greater responsibilities in the future. The fireman should see that all parts are lubricated while on the line of road, and where the coal is not prepared he should watch closely for any foreign matter which would be liable to cause a stoker failure. The engine crew should see that the conveyer hopper is empty on arrival at the terminal and all slides closed. This will prevent the conveyor being overloaded or clogged when the engine is coaled.

The report is signed by J. P. Russell (chairman), Southern; J. A. Mitchell, N. Y., N. H. & H.; W. J. Fee, Grand Trunk; H. E. Reynolds, C. R. I. & P., and E. Von Bergen, Illinois Central.

Discussion

The discussion of this report was confined almost entirely to the methods of handling locomotive supplies and tool equipment. E. Von Bergen (Illinois Central) described a monthly report which is being made up to show the amount of supplies issued to various engine crews, from which any cases of excessive issues may readily be determined and investigation made to learn the cause and apply corrective measures. The discussion disclosed a lack of uniformity in the methods of checking supplies on and off locomotives. In some cases they are checked both at the outgoing and the incoming terminal. In other cases they are checked out and in at the home terminal only. The use of individual tool boxes of convenient size which can be handled by the enginemen has met with considerable success in conserving the small tools required on locomotives, the engine crews showing considerable interest in taking care of this equipment. In any case the greatest trouble is experienced in looking after the tools while the engines are in the terminal. This is particularly true where the tools are assigned to the locomotive and are taken off after the crew leaves the engine by the supply room attendant.

One advantage which has developed from providing private tool boxes for the enginemen is the incentive which this provides each engineman to accumulate a few tools of his own with which he will make repairs on the road that otherwise would not be made.

The greatest difficulty is experienced in conserving the issues of torpedoes and fuses, one reason being that it is difficult to determine closely the number of occasions arising which actually require their use as intended.

Self-Adjusting Wedge, Feed Water Heater and Booster

The present standard wedge is of the manually adjusted style. It is designed to take up the wear between the driving boxes and the shoes and wedges brought about by the up and down movement between the frame and the boxes. This wear, if not taken up, results in undue freedom of the box between the shoe and wedge. This lost motion is the cause of the so-called "box pound" due to the movement of the box backward and forward between the shoe and the wedge. This brings about a side wear of the crown brasses and a tendency to break these bearings. The hammer-like blows struck against the shoe and wedge by this backward and forward movement of a loose box may result in broken shoes and wedges, and these blows become a prolific cause of broken frames. This lost motion of the boxes, which usually affects the different wheels unequally, tends to cause a variation from the distance intended in the locomotive design in the distance between the centers of the rod bearings. The main driving boxes, due to the greater thrust brought to bear upon them, as a rule, develop the most wear. This wear of the main driving boxes throws undue strain on the side rod bearings, tending to cause rod pounds, broken side rod bushings and brasses, and possibly bent and broken side rods.

Lost motion in connection with main wheel driving boxes tends to increase the steam piston stroke and shorten the steam cylinder clearance space at the end of stroke, and when allowed to become extreme may bring about cylinder knocks due to the steam piston striking the cylinder heads with a tendency to knock them out. Lost motion of the main driving boxes is taken up by the steam piston at the beginning of its stroke and live steam is thereby permitted at any given valve cut-off to follow the piston further than intended, thus causing a loss in expansion value of the steam, and a loss of fuel.

The taking up of lost motion existing in main driving box parts through steam piston pressure moves the main driving wheels bodily back and forward to the extent of such lost motion, thus setting up a tendency for the wheels to slip during this movement. This is claimed to be a most common cause of wheel slipping and of troubles in that connection in moving heavy trains, especially where the rails are bad or conditions adverse.

That these results of failure to prevent undue lost motion of the driving boxes in the frame are frequently the cause of locomotive failures and always a source of increased maintenance cost is too well known to require further comment.

The engineman has always been held responsible for allowing any such undue lost motion, and until within the past few years usually attended personally to the setting up of the adjusting wedges. The most that is expected of him today is that he shall report any looseness or pounding of the driving box parts, the actual work of setting up the wedges, devolving on the roundhouse forces. This condition has not brought about a change for the better.

When the engineman himself took care of this work, it was his practice to so spot the locomotive that the driving boxes were forced up against the shoes, thus giving all possible free play between the driving boxes and the wedges and permitting the wedges to be forced up to the extent necessary to eliminate all lost motion; the wedge was then slightly pulled down to provide the required freedom of movement of the box and to prevent its sticking. It is now not uncommon practice in roundhouses for employees assigned to do this work upon report of the engineman to undertake to adjust the wedges without moving the locomotive at all, thus frequently not fully accomplishing the object desired and thereby permitting the locomotive to return to service in a condition detrimental to itself and the railroad.

The value of a self-adjusting wedge, simple in its design and non-erratic in its action, will readily appeal to all who have to do with either the handling of the locomotive or its maintenance. To the engineman it would mean a more efficient and satisfying machine, to the mechanical department an incalculable benefit in the savings effected in maintenance cost through the tendency to prevent the many troubles herein mentioned as arising through failure to properly keep up the wedges and through the reduction of locomotive failures due to these causes as well as a very considerable saving in the cost of roundhouse labor now required to do the adjusting of wedges, and doing it none too efficiently. In which direction the savings would lay, would, of course, depend largely upon the previously existing conditions.

At first glance, the designing of such a wedge seems quite simple and easily brought about through the placing of a suitably arranged spring underneath the adjusting wedge

and operating on it in such manner as to gradually force up the wedge as lost motion develops in the driving box parts. It is understood that this method, without any change in the adjusting wedge other than adding to it of such a spring and the small parts necessary to give the required spring tension, has been tried out on at least one large railroad. In giving this method a second thought, however, we are likely to look for what we understand actually occurs, that of the wedge being gradually tightened until it grips the box, causing a hard riding locomotive and possible rough usage of the rail as a consequence. This, of course, means the curing of one evil at the expense of acquiring another one practically as bad.

A method of preventing this gripping of the box has been brought forward in a self-adjusting wedge now being used to an increasing extent on many of our railroads. In this device the adjusting wedge is made in two parts which might appropriately be referred to as an adjustable wedge and a floating wedge. The adjustable wedge is tapered on one side to suit the taper of the frame jaw with a reverse taper on its opposite face. The floating member is also tapered, its thickest part being at its upper end, and it fits between the adjusting wedge and the driving box. A wedge bolt, attached to the adjusting wedge as usual, passes down through the pedestal binder and has attached to it below the binder the adjusting spring and the parts necessary to give this spring the required tension. The floating wedge is made of such length that when fitted into the driving box jaw, there is not less than 3/16 in. nor more than 5/16 in. clearance or play for it to move up and down between the pedestal binder and the frame. With this arrangement, if the driving box should move up in the frame jaw, there would be a tendency for it to carry the floating wedge with it in case there was any clearance between the top of the floating wedge and the top of the frame jaw. On account of the tapers of the two wedge parts this would tend to bring about a loosening of the driving box between the shoe and wedge. Before this could be effected, however, the small clearance given the floating wedge between the pedestal binder and the top of the frame jaw would bring the top of the floating wedge up against the top of the jaw, checking any further tendency to cause undue freedom of the box as the floating wedge would then be held stationary even if the box continued to rise in the frame jaw. If the driving box should move down in the frame jaw the tendency would be to carry the floating wedge with it and at the same time there would be a tendency to force down the adjusting wedge against the spring tension. This would bring about a loosening of the driving box between the shoe and wedge. The limited clearance space of the floating wedge in the frame jaw, however, would cause the lower end of the floating wedge to strike the binder and prevent further tendency to cause undue freedom of the box, as the floating wedge would then be held stationary even if the box continued its downward movement.

Reports from several of our members located on roads having this device in use and who have had actual experience with it, as well as from several mechanical superintendents on roads having it in use, state that it gives excellent results.

While any type of self-adjusting wedge is supposedly automatic in its action, it must be remembered that none are automatic in maintenance. Like all mechanical devices they require a certain amount of attention, the labor required, for such attention being, of course, considerably less than is necessary for looking after manually adjusted wedges. The principal attention to self-adjusting wedges should be for regular lubrication, absolutely necessary with any type of wedge, and the adjustment of the adjusting spring.

It is impossible to give accurate figures on the savings in cost of upkeep of the frame, box parts and runnings gears as between engines having manually adjusted wedges and ones with self-adjusting wedges for the reason that many troubles with these parts which could be caused by poorly maintained driving box parts might also be due to other causes. However, a table prepared by an eastern railroad shows in a general way results obtained from locomotives of same type with self-adjusted wedges of the type just referred to.

[The table gave in detail the amount of rod work required on 20 locomotives of the 2-10-2 type equipped with the self-adjusting wedges, from July 18, 1920, to January 31, 1921, during which period the engines aggregated 408,447 miles, or slightly more than 20,000 miles each. Four engines, aggregating 83,800 miles, received no rod work whatever. Eight engines, aggregating 161,865 miles, received complete rod work. On the remaining eight locomotives 12 No. 3 brasses, 8 No. 2 brasses, and one set of main bushings were renewed. No crown bearing or wedge material was used. —EDITOR.]

Feed Water Heaters

From 55 per cent to 58 per cent of all heat generated in the firebox is lost in exhaust steam. This great loss of heat is due to the necessity of exhausting steam from the steam cylinders while still in its gaseous form and to the fact that it requires about 970 heat units simply to hold water in the form of steam, all of which, together with such additional heat units as may be in the exhaust steam, is allowed to pass out of the locomotive stack without doing any additional work other than acting as a draft on the fire.

Considerable success has been achieved in heating feed water for boiler use by means of exhaust steam. It is our understanding that this practice has long been successfully made use of in connection with stationary boilers; also, that it is used to a considerable extent in European countries on locomotives. Germany alone is said to have 10,000 locomotives equipped and to be adding this equipment at the rate of 2,000 feed water heaters per year. That this method has not received more consideration in this country in the past has probably been due to cheap fuel and lack of an efficiently developed device for the object in view.

Generally speaking, feed water heaters making use of exhaust steam are of two kinds known as the closed type and the open type. In the open type the exhaust steam either goes directly into the feed water, and in condensing gives up its heat to the water or goes through tubes surrounded by the feed water, heating this water while being itself condensed in the tubes. When it goes directly into the water it is found advisable to pass the exhaust steam through an oil separator enroute to the feed water heater to prevent lubricating oil contained in exhaust steam from entering the locomotive boiler. In this type the heater is open to atmospheric pressure and the pump is placed between the heater and the boiler check. In the closed type the water is forced through tubes in an enclosed heater, these tubes being surrounded with exhaust steam which heats the water as it passes through the tubes. In this type the heater is between the pump and the boiler check and is subject to boiler pressure.

In the open type on account of the heater being open to atmospheric pressure the feed water can be heated only to the normal boiler temperature of 212 deg. F. In the closed type it is possible to heat the water to within 10 to 15 deg. of the temperature of the exhaust steam, which may run as high as 250 deg. F.

About one-sixth or 15 per cent of the exhaust steam which would ordinarily go out through the locomotive stack is diverted to the use of the feed water heater.

One type of heater which has been applied to probably one-half of the American locomotives so far equipped has an arrangement whereby after the exhaust steam going to

the heater has been condensed, this water can be filtered, freeing it of any lubricating oils that it may contain, and be returned either to the locomotive tender or into the suction pipe of the pump carrying the feed water to the heater. By this means it is claimed that the tender water capacity is in effect increased 10 per cent to 15 per cent.

That a large fuel saving and actual increase in boiler efficiency will result from such installation seems to be generally believed. The economical results obtained are due not only to the fact that a large amount of the heat from the exhaust steam is reclaimed, but also because the rate at which the fuel is burned on the grate is reduced.

Our information is that some eighteen of our American railroads are today using or experimenting with feed water heaters, although not to exceed seventy-five locomotives all told are equipped, and that five different types of feed water heaters are being tried out. Owing to the limited number in use and the time used, reliable figures as to the average cost of maintenance of such devices are not available, but it is believed it will be well within the bounds of reason as compared to the savings which it is believed can be brought about by their use.

A summary of a number of runs made with a freight locomotive on the New York division of the Erie Railroad equipped with a feed water heater of the closed type heater, as compared with the same number of runs using the injector, is shown in one of the tables. A summary of nine runs with feed water heater and nine with the injector, in passenger service with a locomotive on the D. L. & W., equipped with the same type of feed water heater, is also shown.

SUMMARY OF ERIE RAILROAD FEED WATER HEATER TESTS

Direction of runs	Heater West	Injector West	Heater East	Injector East
Length of runs—miles	88.3	88.59	89.22	89.44
Actual running time—dec. hours	4.75	5.436	5.658	5.699
Number of cars, including dynamometer car	70	74	80	87
Actual tons, including engine and tender	1,957	1,988	5,029	4,943
Coal fired per locomotive mile	211	245	203	241
Average steam pressure	173	172.0	173.1	172.7
Average superheat	579	597	571	600
Maximum superheat	606	641	604	640
Water evaporated per pound coal as fired, running time	7.917	6.867	7.697	6.529
Water evaporated, per lb. dry coal, R. T.	7.965	6.909	7.735	6.609
Equiv. evap. per lb. dry coal, R. T.	9.270	8.070	9.007	7.772
Total coal fired, running time	18,635	21,705	18,151	21,574
B. t. u. per lb. coal as fired	13,279	13,702	13,357	13,225
Boiler efficiency, based on dry coal, per cent	67.34	57.0	65.1	56.3
Coal fired, running time, to operate feed water pump	231	....	225	....
Water evaporation per lb. coal as fired, running time, based on equal B. t. u.'s (13,225)	7.885	6,628	7.621	6.529
Per cent saving in coal as fired, running time, in favor of feed water heater	18.96	....	16.72	....
Per cent total coal fired to operate feed water pump	1.24	.....	1.24	.....
Per cent net saving in coal as fired, R. T. in favor of feed water heater	17.72	....	15.48	....
Average feed water temperature	71	65	71	60
Average temperature of feed water leaving heater	209	....	193	....
Average temperature of feed water leaving injector	....	178	....	169.5
Maximum temperature of feed water leaving heater	231	....	239	....
Maximum temperature of feed water leaving injector	....	199	....	190

AVERAGE RESULTS OF NINE TESTS WITH AND NINE TESTS WITHOUT FEED WATER HEATER—D. L. & W. LOCOMOTIVE 1135, ON TRAIN NO. 6

	Heater	Injector	Per cent difference for heater
Tonnage	527	535.. 1.5	per cent less tonnage
Running time	193	189.. 2.2	per cent more running time
Total coal, lb.	9,760	12,460..21.6	per cent less coal per run
Total water, lb.	97,919*	95,493..2.27	per cent more water per run
Lb. water per lb. coal	9.97*	7.79..28.0	per cent more water per lb. coal
Coal per ton train	18.4	23.3..21.0	per cent less coal per ton train
Water per ton train	186.	180..1.67	per cent more water, ton train

* 12 runs.

The Locomotive Booster

The locomotive booster is designed to assist in starting such standing trains as the locomotive is capable of hauling on a level track when once in motion without the aid of such device, but which it would otherwise be unable to start without assistance of some kind and for helping it to haul such trains over ordinary grades encountered between terminals; to assist in starting trains out of places where stops are necessary, as at stations, towers, water plugs, switches, etc., or where made necessary by locomotive or train troubles, and which, on account of curvature or grade, are bad places to start from and ordinarily would require the taking of the train slack, perhaps backing up to a place from which a start could be made, setting off of cars, doubling of grade, or obtaining the assistance of another locomotive.

While the addition of a booster increases the tractive effort of the locomotive and thereby makes possible the starting of additional cars and to that extent serves to increase the tonnage which can be hauled under normal conditions or serves to assist in getting heavy trains over the road without delays on grades and at bad starting places, it is in no sense intended as an aid in permitting the overloading of the locomotive to a point beyond what its normal capacity would be when in motion on a level track without this device, as this would make additional aid again necessary in starting from terminals, bad starting places enroute and on ascending grades.

The method of operation is simple. The engineman decides that he needs the booster, he raises the booster latch, which makes contact with the control valve, and the booster is automatically engaged. The booster cuts out automatically when the reverse lever is moved back from the corner, which is at a speed of approximately 12 to 15 miles an hour, or it may be cut out instantly by the engineman knocking the booster latch down, which is similar to knocking out an electric switch.

The claims made for the booster are that it puts any locomotive with trailing wheels into the next class above in starting effort, because the trailing wheels act as an additional pair of drivers; that on freight trains this means more tons handled annually because of greater starting effort and acceleration, and avoids damage to machinery and equipment because of a smooth, steady start; that on passenger trains it means smooth starting and quick acceleration to road speed, protects the equipment from damage and renders schedules more easily maintained by avoiding delays in starting; that it reduces by one-half the time required to get trains to road speed and that it pays its own fixed and maintenance charges several times in doing this through reduced wear and tear on rods, pins, cross-head keys, tires and other parts of the machinery of the locomotive that would ordinarily be caused by slipping in the effort to start, and that when the train is up to road speed it has no more effect on the locomotive's operation than so much coal on the tender.

The following record of a run made on the West Shore line will give a good general idea of the benefits claimed for the booster as shown in actual performance. Engine 3149 left Ravena with a crew that had no previous experience with the booster and the intention was to determine whether or not the full tonnage of 2,582 to 2,600 could be taken through to Weehawken without the usual reduction to 2,100 tons at Newburgh. The booster was used on all starts as well as on grades at speed.

The first test was at Catskill where water was taken, the water plug being located at the bottom of two grades, the ascending one being .39 per cent. The usual practice was to leave the train at the top of the west grade, cut off and run for water, then come back, hook up and make a run for the other grade. This practice was disregarded and the train was hauled down to the water plug. After taking water the booster was cut in and the train carried over the grade at satisfactory speed. With the booster cut in, 5 miles per hour was quickly gained with the draw-bar pull showing 41,067 lb., and for a distance of 580 ft. the speed increased from 5 to 8½ miles per hour. The booster was then disengaged and the locomotive required to take the load entirely and the draw-bar pull dropped to 33,497 lb., or a difference of

7,570 lb. in favor of the booster. This represented 22 per cent increase in draw-bar pull. The throttle and reverse lever were not touched.

The train continued on to Kingston and at each stop the booster was cut in for starting and showed rapid acceleration. The ruling grade is at Haverstraw, six miles long and an average of .47 per cent. A stop was made for water and the train started with the booster. When the grade was reached the speed was 33 miles an hour. On the grade the first mile showed a speed of 28½ miles an hour; the second mile a speed of 19 miles an hour, the third mile a speed of 12 miles an hour, the fourth mile a speed of 8 miles an hour, and the fifth mile a speed of 7½ miles an hour.

Speed was falling very rapidly and at the end of the fifth mile the draw-bar pull registered 36,441 lb. The booster was then engaged where the grade was .52 per cent and in 432 ft. the speed was 8 miles an hour and the draw-bar pull 42,900 lb., a difference of 6,459 lb. or 17 per cent increase with the booster. The speed then gradually rose and reached 10 miles an hour in the next ¾ mile and with tonnage of 22.6 per cent over the previous capacity of the locomotive. One and five-eighths miles of grade yet remained and when the train passed over the top the draw-bar pull showed 45,-080 lb. The booster was then cut out and the train arrived at Weehawken with the original tonnage of 22.6 per cent more than this class engine had ever before taken through. A day or so later the regular crew caught engine 3,149 and, not to be outdone by the test just related, brought through 2,618 tons, representing an increase of 24.6 per cent over the ruling tonnage.

The report is signed by T. F. Howley (chairman), Erie; Frederick Kerby, B. & O.; J. P. Stewart, A. T. & S. F.; John Draney, D. L. & W., and J. A. Talty, Franklin Railway Supply Company.

Discussion

The discussion of the self-adjusting wedge indicated that there had been little experience with locomotives having complete installations of the device among the members present. In most cases mentioned the wedges were applied on the main drivers only. The opinion was expressed, however, that to get the full benefit of the device it must be applied on all boxes and this general application seems now to be the tendency. In caring for self-adjusting wedges the most important point, according to the experience on the New York Central, was stated by J. H. De Salis to be the proper attention to the adjustment of the springs. If these are too loose the piston force at full stroke is sufficient to force the wedge down against the spring. If the spring is too tight a stuck wedge results. These difficulties are avoided by keeping the spring adjusted to a height of 1½ in. from the jam nut to the binder. The experience of those taking part in the discussion indicates a material increase in the mileage obtained from driving boxes and better rod conditions than have been obtained with the manually adjusted wedges.

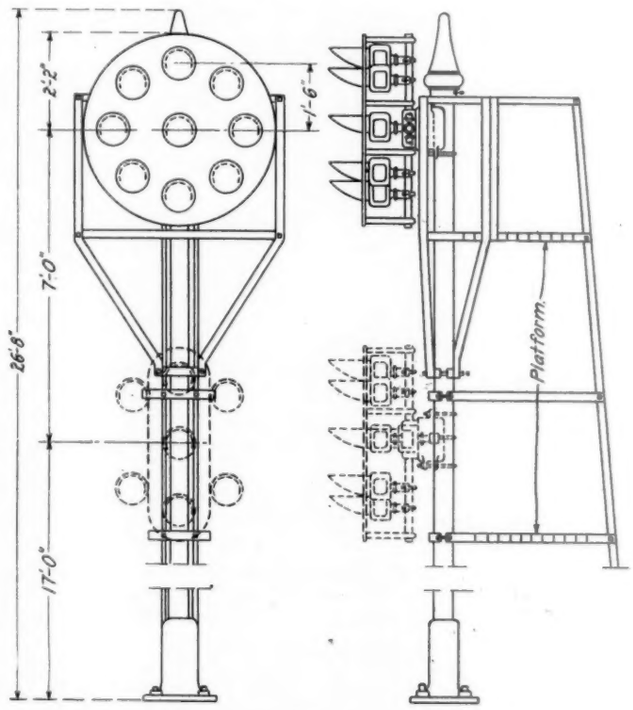
In discussing the feed water heater, J. N. Clark (Southern Pacific) stated that this company has two open type and two closed type heaters in service, one each in a bad water district and one each in a good water district. The results obtained from these installations are, however, not yet available.

In the discussion of the locomotive booster, a number of installations of this device were mentioned, all of which have demonstrated their ability to effect considerable improvement in the handling of heavy trains. W. H. Corbett stated that the Michigan Central has three boosters in service on passenger locomotives, which have eliminated jerking and the necessity for taking slack in starting heavy passenger trains and have materially increased the rate of acceleration in starting these trains. The booster is used up to about eight miles an hour.

A trial on the Chicago & Eastern Illinois was referred to in which a 4,383 ton train was taken over a grade, over which, without the booster with the same locomotive it was required to reduce the tonnage to 3,976. With the booster the heavier train was pulled up the grade in 19 minutes, while the light train without the booster required 23 minutes to move over the same distance.

New Design of Position-Light Signal

THE PENNSYLVANIA Railroad now has in service nearly two thousand signals of the position-light type—925 high signals and 1,038 dwarfs; and with recent improvements and simplifications the cost of installation and maintenance of the signals has been so reduced that further and stronger claims are made for economy of operation as compared with semaphore signals. These signals, the invention of A. H. Rudd, chief signal engineer of the road, and Dr. William Churchill, of the Corning Glass Works, give their indications by uncolored electric lights, both night and day; and they have now been in use over six years. Their development has been recorded in the *Railway Age* in numerous articles, particularly those of January 8, 1915; July 21, 1916, and July 26, 1918 (page 177).



Construction of the New Position-Light Signal

The latest improvement is a simplified and symmetrical frame and background; and with this arrangement a row (or rows) of not more than three lights in a row, now serves to give any and all indications. From a statement prepared by Mr. Rudd we take the following descriptive matter:

The position-light signal was originally designed for the purpose of signaling a portion of the four-track main line, electrified for local passenger service, while retaining the steam trains for freight and through passenger service. The experimental signals carried five lights in a row—those first installed had two rows of four lights each; the bottom row normally horizontal, so that, if the top lights were extinguished, the bottom row would indicate stop. Eight lights were, therefore, displayed at all times. The large background was no detriment on bridge signals, but on account of the

surface exposed to wind pressure ground masts had to be 7 in. or 8 in. in diameter.

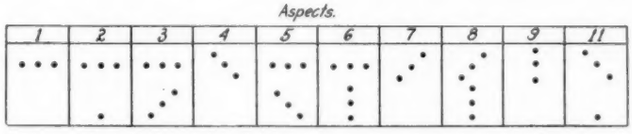
The New Design

The illustrations show a new design which has been developed and the aspects which may be displayed. The line drawing shows the details of construction and the half-tone photographic perspective the appearance of an automatic block signal. It will be noted that in the latter the platforms are smaller than in the drawing, this change having been adopted since the drawing was made.

The indications of the aspects are in accordance with the Standard Code, as follows:

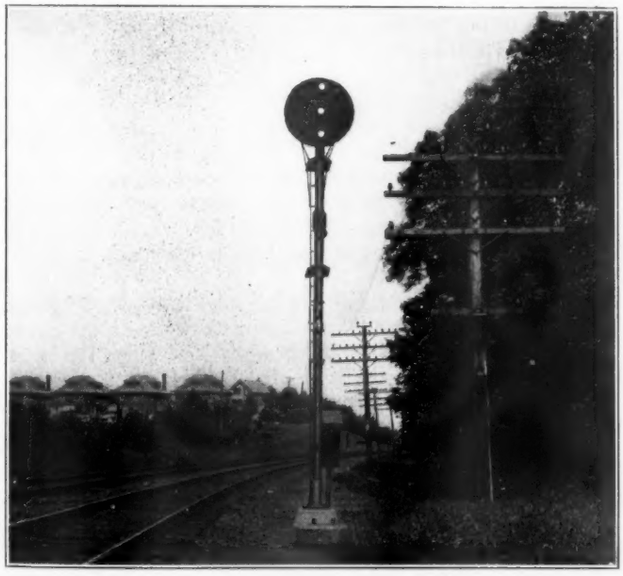
1—Stop.
2—Stop, then proceed. (Rule 509, Standard Code.)
3—Proceed at slow speed prepared to stop.
4—Proceed with caution prepared to stop short of train or obstruction.
5—Proceed at slow speed prepared to stop short of train or obstruction.
6—Proceed at restricted speed.
7—Approach next signal prepared to stop.
8—Approach next signal at restricted speed.
9—Proceed.
11—Approach home signal with caution.

Number 4 is the manual permissive block signal. No. 5 is to be used as the up-grade signal which may be accepted by tonnage freight trains without stopping, while other trains



Position-Light Signal Aspects, Pennsylvania Railroad

stop before proceeding. No. 11 is the distant switch signal. It will be noted it is similar to No. 4, which, under the rules, may not be accepted by a passenger train without stopping. The addition of the bottom light permits passenger trains to



Position-Light Signal with Circular Background

accept it. If, at some future time, the stop requirement in Rule 509 should be eliminated, aspects Nos. 3 and 5 would be eliminated, and No. 2 substituted for aspect No. 5.

Dwarf signals may be four-position:

(a) Horizontal for indication No. 1.
(b) 45 deg. upper right hand quadrant for indication No. 3.
(c) 45 deg. lower right hand quadrant for indication No. 5.
(d) Vertical for indication No. 10, proceed at slow speed.

Aspect b being displayed in terminals, with track clear but next signal at stop.

Aspect c with track occupied, and,

Aspect d with track clear and next signal clear and a and b, and rarely c, being used out on the road.

It will be noted that a background is provided for the lower row vertical only, this being a restricted speed signal (restricted speed is one-half the authorized speed) but not for the diagonal rows or the single light, as these are slow speed signals and long range is unnecessary. The reduced size of the background and wind pressure area eliminates the necessity for the large masts. Signals can be installed on existing masts, and they need less clearance than a semaphore.

Experience shows that these signals, lighted six hours a day, cost no more to operate and maintain than semaphores. Assuming the cost of current from primary batteries at $5 per k.w.h., the signals could be lighted 24 hours and still compete if their power could be obtained for $1.25 per k.w.h. It is claimed that it can be furnished by farm lighting outfits for 5 cents, but even if it cost 10 cents, the saving would be $1.15 per k.w.h.

The lamps used in the high signals are 12-volt, 6 watt, burned under voltage, so that the total energy required for the three lights is 15 watts, and for the three lights and marker (aspect No. 2) 15 watts when the signal is at caution or clear and 20 watts when at stop. The dwarf signal requires two 12 watt lamps burned under voltage, with an actual watt consumption of 16 for the two lights.

Given then, even the same cost for installation as for semaphores, but less cost of operation and maintenance in all cases, it seems that the logical procedure is to install these signals everywhere instead of motors as an economic proposition.

Advantages of the Position-Light Signal

The advantages of any light signal, displaying the same aspects day and night and without moving parts and their incidental failures, are so obvious and have been so frequently set forth that comparison with the semaphore in this respect appears unnecessary. A color-blind man can read a position-light signal accurately. The lights penetrate fogs better than colored lights. Two lights must fail before the signal ceases to be displayed effectively. Four positions *without combination* are available and used, as against three positions of the semaphore and three colors which may be seen distinctively at a distance; and this additional position gives the greatest flexibility.

If two lights are extinguished on the bottom row, either diagonal or vertical, with the top row horizontal, the aspect "Stop and Proceed" is displayed; if all lights are extinguished on these rows, the indication is "Stop." In general, the more lights extinguished, the more restrictive the indication. False clear indications due to faults in these signals have been eliminated, and the day of experimentation is past.

A CHICAGO GREAT WESTERN passenger train was derailed near Marshalltown, Iowa, on September 9, and the two rear cars were overturned and later were destroyed by fire. Thirteen persons were injured, none seriously.

ANTI-RAILWAY PROPAGANDA IN ITALY.—An Italian journal is reported as estimating that if the 200,000 railway workers of that country were each employed in driving 10-ton trucks 8 hours a day for 300 days a year, five times as many ton miles would be carried as by the Italian railways now. The number of employees necessary for repairing trucks and for loading and unloading freight are not mentioned.

Two Roads Secure Excellent Results from Water Treatment

Reports which have been prepared by the Missouri Pacific and Illinois Central on the operation of their respective systems of water softening for 1920 indicate that water treatment on both of these roads is being attended with highly profitable results. As will be noted in the tabulation for each road, the Missouri Pacific reports a saving for the year of $481,129 through the use of treated water, a figure representing a return of 197 per cent on the total amount invested in treating facilities, while the Illinois Central reports a saving for the year of $292,456, or about 120 per cent on the total investment.

Condensed Report of Results of Water Treating for 1920

Number of Plants	Amount Invested in Treating Facilities	Quantity of Water Treated in Gallons	Scaling Solids Removed in Pound	Gross Annual Saving	Cost of Treating Process	Net Annual Saving
			Missouri Pacific			
67	$244,201	1,617,360,000	4,517,883	$624,708	$143,579	$481,129
			Illinois Central			
20	247,801	1,149,370,000	2,547,609	382,684	69,684	292,456

Although the savings as reported constitute attractive figures in themselves it is worthy of note that in both cases they are intended to represent only the value of the reductions effected in the amount of fuel required by the locomotives, the flue renewals, the amount of flue calking and other running boiler repairs and the time lost by locomotives while undergoing boiler and firebox repairs, less the cost of treatment, no consideration having been given to such items as the improvement of train schedules, the reduction in the number of engine failures, increased power, etc., as are frequently mentioned in connection with water treatment.

In each case the gross saving from water treatment was arrived at by taking 15 cents as the aggregate saving in the above items effected for each pound of scaling matter removed by the treating process and prevented from entering the boiler, from which the net saving was obtained by subtracting the interest and depreciation of the treating plant, the cost of chemicals, and the cost of operation, maintenance and superintendence. The value of 15 cents was taken as the equivalent for the year 1920 of the value of 7 cents derived in 1911 and incorporated in the report of the Water Service Committee of the A. R. E. A. for 1914.

The Missouri Pacific water treating system includes 67 plants, 20 of which are new, 13 having been built in 1920 and the remaining 7 completed early in 1921. As a result of the operation of these plants 28.8 per cent of the 5,616,565,000 gal. of water used for steaming purposes was treated. The total consumption of water on the system during 1920 was 6,526,826,000 gal. and the average cost of treatment in 1920, including operation, 10 per cent on the investment in treating facilities and the cost of supervision was 8.87 cents per thousand gallons. This is compared to 8.72 cents in 1919, 6.57 cents in 1918, and 4.71 cents in 1917, the increase in cost being attributed to the increased cost of chemicals and labor. On the Illinois Central there are 20 treating plants which during the year treated 1,149,370,000 gal. of water at a cost of approximately 8 cents per thousand gallons.

As an additional item of interest in connection with the water softening on the Missouri Pacific the following is quoted from the report:

"It is estimated that a saving of at least 60,000 tons of coal was effected due to the removal of the scale-forming material which would otherwise have been deposited in the boilers. The 4,517,883 pounds of scale removed, averaged into the 750 engines using this water, and assuming only 25 per cent adhered to the tubes and sheets, would amount to 1,505 lb. per engine, which quantity would form an insulating coating about 3/16 in. thick. Experiments have shown that fuel wasted to heat through this thickness of scale insulation varies from 20 per cent to 30 per cent. It is safe to assume that the 1,123,000 tons of coal necessary to evaporate the 1,617,360,000 gal. of water would have been increased at least five per cent by using untreated water. At a number of stations where the supply is secured from creeks or rivers, a very large quantity of mud and silt was also removed from the water, the saving from which is not included in the above figures. There is also the large saving in boiler repairs and loss of engine time which would have been caused by this large scale accumulation."

"For Politics Only"

Following is a portion of a letter written to Congressman Carl Hayden at Washington, D. C., by Epes Randolph, late president of the Arizona Eastern and the Southern Pacific of Mexico on August 18, 1921, four days before his death and printed in the Los Angeles Times of August 23. It is probably his last written expression on important public questions and is of such direct interest to railway men that it is reprinted herewith.

"There is an insect in certain parts of Mexico called the alacran. The female of this species gives birth once in her lifetime to a dozen or more infant alacrans who immediately climb upon the body of the mother and subsist upon her until she is no more. When Socialism first blossomed in this country the railroads belonged, for the most part, to a few men. The demagogue politician thought it a fine scheme to imitate the baby alacrans, jump on the Huntingtons and Hills and suck the life blood out of the railroads because these wicked fellows had dared amass fortunes. The work was quickly done, but the doers forgot to stop when railroads no longer represented individual fortunes.

"The late E. H. Harriman induced the investment of several hundred million dollars in the Southern, Pacific and other western roads, and thus gave to the people of this country the best transportation system the world has ever seen, and at the lowest rates for service. Mr. Harriman's ownership in the Southern Pacific, as shown by the company books, was 1,100 shares of stock, par value $100. His efforts caused the country to prosper as it had never prospered before, and incidentally earned modest dividends for the 34,000 owners of the company's securities, many of whom were widows and orphans. Mr. McAdoo, in one year only, put this great transportation system, which it required 35 years of brain and energy to create, 'on the bum,' and your very constituents are today crying out for relief. Why did McAdoo do this? The answer is, 'For politics only,' and he didn't get the job at that.

"The rancher today gets all the labor he wants for 15 cents an hour and others stand by begging to work at the same rate. The railway company is forced by law to pay the same type of labor, engaged just across the fence from the farmer, 34 cents an hour. Why is this? 'For politics only.'

"When will you lawmakers give your constituents proper relief? My guess is you will do so when the reason shall become 'for politics only' and not before. In other words, when the great mass of voters wake up and learn that railroad headquarters are located in the Capitol at Washington and not in San Francisco, Tucson or elsewhere as they now believe to be the case. A governmental agency today fixes freight rates; another governmental agency fixes railroad wage rates, but no governmental agency guarantees that the holder of a railroad security shall have one dollar's interest on his investment, yet a governmental agency does provide that he shall not have more than 5 per cent.

"Union labor today, to a very large extent, dominates the politics of this country. For eight years the White House doors swung open to one Samuel Gompers, a foreign-born individual of great skill in the art of creating industrial unrest.

This same creature has, on occasions, stood on the public rostrum, side by side with the President of the United States, and poured insidious poison into the ears of an unthinking audience. A foreign-born individual with a union-labor card in his pocket this day holds a Cabinet portfolio. Can there be any reason for these things except 'for politics only'?

"I once spent a night on the desert and was kept awake by coyote howls uttered from a mesquite thicket. It sounded like there were a million of them. At daylight next morning I took my shotgun, went out to the thicket and was disgusted to find there only an old female coyote with two pups. No doubt you have had like experience. Labor-union leaders are in the thicket and their howl is intimidating the American statesman. If he would inspect the thicket he would find there more howl than votes.

"The people, who, by the sweat of their brows, created this country, own it and it is to be hoped that the time is not far distant when they will control it. The people who count are beginning to wake up. Two years ago in your very town of Phoenix, a brick mason received $10 a day and was allowed by grace of the 'walking delegate' to lay 700 brick only. Today he still receives his $10, but he lays 2,500 brick with no more effort than he put forth to lay the 700. Then Phoenix was a 'closed shop' town; today Phoenix is an 'open-shop' town.

"Transportation is the most important industrial institution of this country. When will the government loosen its strangle hold and let the railroads become 'open shop'? The answer to that question is very much more important than the question of whether we shall have a Democratic administration or a Republican administration.

"For forty-five years I have labored. The laboring man, whoever he may be and however he may labor, with head or hands, has my sincerest sympathy and utmost good will. The labor leader who organizes his subjects and rules them with a despotism comparable only to that of the erstwhile Kaiser Bill, that he may wax fat on the proceeds of their labor (which he does) should find no lodgment in this republic. He should be sent along to join his brother, Bill Haywood, in Russia, and will be. Sam Gompers, backed by his full eight years of prestige and power, was not able to saddle upon this country as its President the man who bore the stamp of Woodrow Wilson's approval. The brush was beaten, all right, and to a finish, but the coyotes were not there and the howl didn't register in ballots."

Labor Board Hears New York Central Dispute

HEARINGS BEFORE the Railroad Labor Board on a small but significant dispute between the New York Central and the Railway Employees' Department of the American Federation of Labor were opened on September 13. The dispute in this case arose from the action of the New York Central in transferring skilled and unskilled employees engaged in the construction and maintenance of telegraph lines along the New York Central right-of-way from its payroll to the payroll of the Western Union Telegraph Company. This change was made on April 15 and the employees, through the Railway Employees' Department, protested to the Board, asserting that the move was a "mere subterfuge" to avoid payment of wages fixed by the Railroad Labor Board. In the employees' submission to the Board they stated that the rates of pay and working conditions of the telegraph company (supposed to be less favorable to the employees) were applied to the men so transferred and cited as a precedent the Board's Decision No. 120, issued as a result of the controversy between the St. Louis-Southwestern and certain of its maintenance-of-way employees regarding the substitution of certain employees by employees of an outside contracting organization. This decision was described in the *Railway Age* of April 22, page 990.

The railroad, in its submission to the Board, explained that a contract or agreement between the Western Union Telegraph Company and the New York Central and its subsidiaries was made in 1907. This contract provided that, in return for the acquisition by the telegraph company of the telegraph facilities owned by the carrier and for the use of the carrier's right-of-way for the telegraph company's lines, the Western Union would furnish the railroad telegraph service up to 40 per cent of its total wire mileage. The telegraph company was to provide for the skilled labor and the carrier for the unskilled labor used in the erection and repair of all telegraph wires. By the terms of a supplemental agreement made in 1910 the New York Central agreed to carry both the skilled and unskilled labor employed in this work on its own payrolls, billing the Western Union for 100 per cent of the amount paid to station linemen and 50 per cent of the amount paid for unskilled gang labor when on construction work.

During federal control, the railroad explained, the Western Union took exception to the increases in wages granted by the director general and refused to honor the bills presented to it by the carrier. By the end of federal control the director general held unpaid bills of the New York Central against the Western Union totaling $1,171,074. This attitude of the telegraph company continued after federal control and as a result an additional claim totaling over $200,000 was run up by the railroad company against the Western Union. After being called upon by the director general to settle these accounts the New York Central reached an agreement with the Western Union whereby the latter paid 60 per cent of the bill for labor under this agreement during federal control, and between 75 and 80 per cent of the amount which has accrued since the end of federal control.

Henry T. Hunt Represents A. F. of L.

Henry T. Hunt, formerly a representative of the public on the Labor Board, appeared before that body for the first time as a legal representative of the Railway Employees' Department of the American Federation of Labor. Mr. Hunt's argument against the action of the company was based largely on legal citations showing that the employer is not necessarily the party which pays the employee, but that party which directs the employee's work and has the power to hire, discharge and make substitutions. Employees in this case, Mr. Hunt contended, are joint employees because they are directed by the joint superintendent, an employee of both the New York Central and the Western Union, even though they are paid by the telegraph company. He then developed the argument that joint employees of this character properly come under the labor provisions of the Transportation Act. Carrying out this thought, Mr. Hunt said that should the position of the carrier be upheld it would only be necessary for the railroads to get someone else to pay their employees to evade all of the labor provisions of the Transportation Act.

Jacob Aronson presented the carrier's case. After calling attention to the fact that the contract with the Western Union was made in 1907, fourteen years prior to the passage of the Transportation Act, he stated that if the Board ruled against the railroad in this case it would have to conclude that the railroad had enough foresight fourteen years ago to make the preparations necessary to avoid the provisions of the Transportation Act now. The defense of the New York Central, as outlined by Mr. Aronson, was based largely on the fact that the action taken by that carrier in transferring these employees from its payroll to the Western Union payroll was taken in accordance with the provisions of the supplemental agreement of 1910, and that by ruling against the railroad in any manner in this case the Board would be taking from the carrier the right of contract. Mr. Aronson called attention to the fact that this agreement is nothing more or less than

the lease of the small amount of wire mileage owned by the New York Central and of the right to use the carrier's right-of-way for the lines of the Western Union. In return for this the Western Union paid the carrier in service instead of in money, he added. The whole matter, Mr. Aronson said in closing, is therefore entirely outside the Board's jurisdiction.

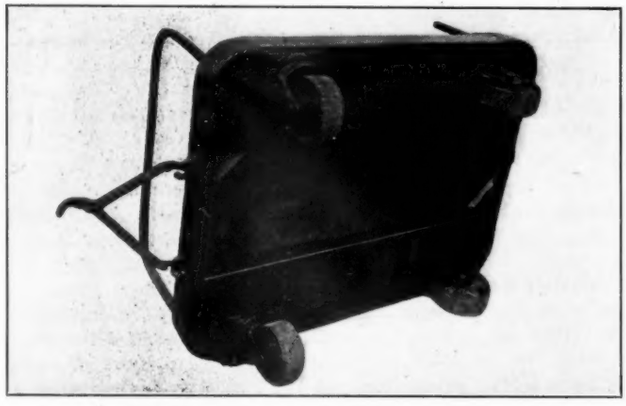
The hearings were closed on the same day, the Labor Board taking the case under advisement.

During the past week the Labor Board has been busy in hearing a large number of smaller disputes through the agency of its three bureaus composed of three members each, the New York Central case being the first case which has been heard by the full Board for some time.

A Heavy Duty Trailer

THE MOVEMENT of heavy concentrated loads such as large castings, etc., constitutes an important handling problem in railway freight stations, warehouses and transfer stations. In such work, cranes, trucks, tractors and trailers and various other material handling devices are being increasingly used. For such work the Sharon Pressed Steel Company, Sharon, Pa., has developed a trailer specially designed for heavy duty service with tractors.

The trailer frame consists of four 3/8-in. channel sections which are pressed from 1/8-in. hot rolled open-hearth steel and riveted into one-piece channel section corner pieces pressed to a 6-in. radius. By varying the length of the side and the end rails, the trailer can be made in any length up to 72 in. and in any width up to 50 in. Two additional members, of 3-in. pressed steel channel, run lengthwise be-



Under Platform View Showing Construction Details

neath the floor and are riveted to the end rails and braced, laterally, to the frame with front and rear pressed steel "V" braces which take the pull of the 5/8-in. steel forged coupler. Either one or two couplers can be used.

The rear wheel and front caster supports are 3-in. pressed steel channels riveted to the side rails and the longitudinal members of the frame. The rear wheel brackets are pressed from 1/4-in. steel with two stiffening ribs on each side. The rear wheels are of malleable iron with six double-web spokes and 3 1/2-in. face and are equipped with 3-in. Hyatt roller bearings on a hardened and ground 1-in. shaft.

The front casters are of heavy-duty type, ball and roller bearing equipped, bolted to a 1/2-in. steel plate which is riveted to the frame. The floor of the trailer is 1 1/4-in. oak recessed flush in the side and end rails. All frame members are flush on the bottom, thus affording an even support when the trailer is used in connection with a lift truck.

The trailer was recently given a severe test with a load of 8,000 lb., indicating its adaptability to exacting service.

Flexible Metallic Packing

AN UNUSUAL and interesting rod packing, said to combine the adjustment features of non-metallic packing with the wear-resisting qualities of metallic ring packing, is "V" Pilot Packing, made by the Pilot Packing Company, Inc., Chicago. The packing takes its name from the patented contour of the metal which is shaped like a "V" to insure an entirely metallic surface on the rod at the

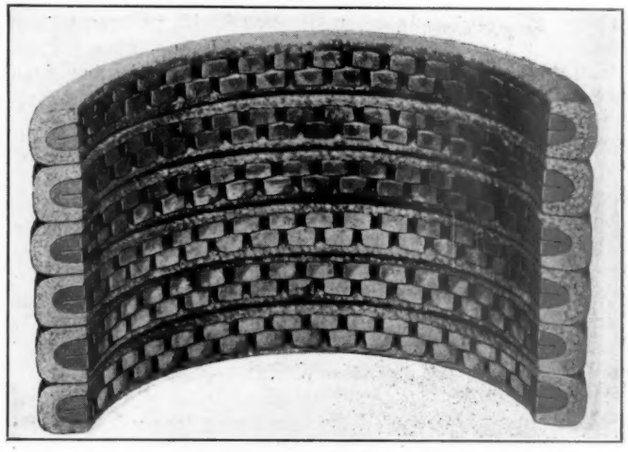


Fig. 1—Cross Section of a Set of "V" Pilot Packing

slightest pressure of the gland. The face of the metal, as shown in Fig. 1, is slotted, the slots being staggered to prevent the escape of steam down the rod. The slots serve another useful purpose by retaining oil for the lubrication of the rod.

A hasty glance at Fig. 1 may give the impression that there are two pieces of metal instead of one, but on closer examination the V-shape of the solid, white metal bar is apparent.

"V" Pilot Packing has a resilient, pliable back, fitting it for many uses for which purely metallic packing is not

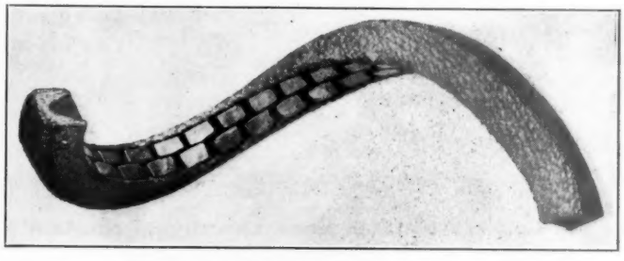


Fig. 2—View Showing Flexibility of New Packing

adapted. Its extreme flexibility, as shown in Fig. 2, permits its use on small rods and provides easy and quick adjustment. This packing has successfully passed the experimental stage and demonstrated its value by extended tests under actual working conditions, having shown unusually long life and resultant economy. It has a wide range of application and is used by railroads for air pumps, boiler feed pumps (steam and water ends), valve stems, throttle stems, power reverse gear rods, stationary air compressors, steam engines, hot and cold water pumps, ammonia pumps, roundhouse washout pumps, power plant feed water pumps, pumping station (steam or water glands), steam hammers and many other purposes.

"V" Pilot Packing is supplied boxed and ready for immediate service and is applied in the same manner as ordinary fibrous packing.

General News Department

The Canadian Ticket Agents' Association will hold its thirty-fifth annual meeting at Ottawa, Ontario, on October 11, instead of September 20, as had been planned.

A fire in the roundhouse and local shops of the Erie Railroad at Jersey City, N. J., on September 11, destroyed one building, partly destroyed another one and damaged 18 locomotives; estimated total loss $100,000.

The Executive Board of the Master Boiler Makers' Association, will meet at the Sherman Hotel, Chicago, Ill., on the morning of September 24, to decide on a place for the next annual convention to be held in May, 1922.

"A Shipper's View of the Evolution of Transportation, and Its Effect on Steam Railways" will be the subject of a paper by George C. Conn, director of traffic of the Buick Motor Company, at the next meeting of the Western Railway Club, on September 19, at the Great Northern Hotel, Chicago.

Four masked men held up passenger train No. 2 on the Kansas City Southern between Bloomburg, Tex., and Texarkana on the night of September 6 and robbed the mail car. The bandits (who had concealed themselves on the train), entered the cab of the engine and ordered the mail car uncoupled; they forced the engineer then to run to the outskirts of Texarkana where the actual robbery occurred.

The Joint Committee on Automatic Train Control of the I. C. C. and the A. R. A. will hold a meeting at the office of the American Railway Association, Manhattan building, Chicago, on September 27, to consider the reports of the I. C. C. and A. R. A. inspectors covering performance records of the train control systems which have been inspected on the Chicago & Eastern Illinois and the Chicago, Rock Island & Pacific. At present the inspectors are on the Chesapeake & Ohio installation.

The Los Angeles Limited, train No. 7, of the Oregon Short Line, was held up by two masked and armed robbers on August 31, near Clearfield, Utah, 9 miles south of Ogden. The train was stopped by an automatic block signal and the two robbers, entering the observation car, proceeded to hold up the men only. While one gathered loot in the observation car the other proceeded to the other cars. They then made the conductor start the train and in the outskirts of Salt Lake City, they dropped off.

Railway Electrical Engineers Will Not Meet

The 1921 annual convention of the Association of Railway Electrical Engineers has been postponed indefinitely. This action was taken by its board of directors as a result of a suggestion made recently by the Association of Railway Executives that the various sections of the American Railway Association postpone indefinitely all conventions or curtail them as much as possible. The Association of Railway Electrical Engineers is not officially connected with the American Railway Association, but has applied for membership.

Chief Engineers' Night

The Western Society of Engineers plans a chief engineers' night on September 26, at which prominent engineers on several of the larger railways at Chicago will speak briefly on some of their earlier experiences which they now look back on as turning points in their professional careers. This is the first of a series of inspirational programs designed particularly for the encouragement of the younger men of the society. The speakers will include C. A. Morse, chief engineer, C. R. I. & P.; A. S. Baldwin, vice-president and formerly chief engineer, Illinois Central; H. R. Safford, assistant to president, C. B. & Q., and formerly chief engineer of the Grand Trunk; C. F. Loweth, chief engineer, C. M. & St. P., and E. H. Lee, vice-president and chief engineer of the Chicago & Western Indiana.

No More Mail on Freight Trains

The former practice of shipping monthly, semi-monthly and weekly periodicals by mail, instead of by freight, will be reestablished October 1. The change, it is expected, will save the government approximately $268,000 annually in labor, rent and cartage. Nearly 1,000 publications will be affected.

At the time the freight-shipment plan was adopted in 1911, mails were transported by rail entirely on the weight basis, and the difference in the cost of transportation by freight and passenger trains was material. Since the adoption of payment by space, and the general increase in freight rates, conditions are the reverse of what they were; there is little difference in the cost of transportation between freight trains and mail trains.

Some Unit Costs Show Reduction

The Interstate Commerce Commission's monthly bulletin of freight and passenger train service unit costs for the month of June shows a further reduction in some of the unit costs of railroad operation. The cost per freight train mile for selected accounts used by the commission was $1.753 for the month as compared with $1.89 last year and the average cost per passenger train mile, selected accounts, was 98.4 cents as compared with $1.03 last year. For the first six months of 1921, however, the average cost per freight train mile was $1.95 as compared with $1.85 last year and per passenger train mile was $1.07 as compared with $1.01 last year.

Annual Meeting of the Telegraph and Telephone Section

The annual meeting of the Telegraph and Telephone section of the operating division of the American Railway Association will be held at Cleveland, Ohio, on September 21, 22 and 23. A number of important reports relative to telegraph and telephone development and operation, including those relating to the handling of message traffic, the application of radio telegraphy and telephony to railway work and proper systems of education of employees, will be presented for discussion and action. The March meeting of this section was cancelled and the annual meeting is the first and only one to be held this year.

Protests Against Valuations

Many protests against the tentative valuations which have recently been served by the Interstate Commerce Commission are being received by the commission, objecting on the ground that the commission has either left out or not given sufficient consideration to various elements of value. Most of the protests also object because the commission has not analyzed the methods by which it has made up its figure for final value. A brief filed this week by the Los Angeles & Salt Lake says that the method adopted by the Bureau of Valuation is wrong in principle and results in naming an inadequate figure for the value. It says the bureau has recognized that the figure it has reported does not represent the real value of the property "but a mere rate basis, a term which it uses interchangeably with valuation for rate-making purposes." It is also stated that the bureau method ignores factors of controlling importance. Whereas the commission places a final value of $45,871,093 on this road, R. S. Lovett, chairman of the board, had testified that the property was worth $82,000,000 after approximately $10,000,000 had been added since the valuation date

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1921

Name of road.		Average mileage operated during period.	Operating revenues			Operating expenses						Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals, 1920.
						Maintenance of										
			Freight.	Passenger.	Total (inc. misc.)	Way and structure.	Equipment.	Traffic.	Transportation.	General.	Total.					
Alabama & Vicksburg	July	141	$179,938	$62,146	$258,860	$47,358	$52,011	$7,462	$101.656	$10,260	$220,979	85.40	$37,881	$19,137	$24,872	$36,835
	7 mos.	141	1,313,788	419,259	1,857,083	383,608	412,549	56,652	900,087	82,821	1,853,186	99.80	3,897	—128,390	—92,750	345,632
Vicksburg, Shreveport & Pacific	July	171	216,077	92,935	323,504	46,700	44,334	9,554	119,554	11,929	234,785	72.57	88,719	72,310	60,639	31,685
	7 mos.	171	1,614,631	627,282	2,370,790	401,932	506,522	68,159	964,014	96,537	2,057,303	86.77	313,487	205,642	115,879	496,014
Ann Arbor	July	293	333,682	60,892	412,522	58,534	90,792	7,271	172,187	12,600	341,396	82.76	71,126	50,725	43,245	57,915
	7 mos.	293	2,220,493	361,513	2,716,969	360,694	643,825	58,243	1,291,083	101,315	2,455,275	90.37	261,694	124,600	56,076	—248,451
Atchison, Topeka & Santa Fe	July	8,828	10,225,084	4,151,448	15,482,787	582,438	2,215,940	255,692	5,347,814	313,674	8,698,400	56.18	6,784,387	5,856,342	6,010,029	3,748,279
	7 mos.	8,828	69,579,673	27,859,518	104,682,916	11,285,506	22,413,765	1,841,148	40,186,097	2,596,598	78,088,192	74 59	26,594,723	20,571,128	21,051,305	22,750,699
Gulf, Colorado & Santa Fe	July	1,907	2,202,393	437,963	2,738,798	126,126	449,624	42,672	799,130	71,848	1,476,589	53.91	1,262,209	1,187,530	1,112,327	—191,810
	7 mos.	1,907	13,358,217	2,770,529	16,749,990	2,511,577	3,640,104	290,070	5,932,434	529,065	12,866,934	76.82	3,883,056	3,351,852	2,894,234	—425,880
Panhandle & Santa Fe	July	857	639,360	161,374	835,921	—43,789	185,493	7,488	261,896	18.014	429,006	51.30	406,915	385,313	353,556	43,494
	7 mos.	857	3,764,837	940.917	4,969,485	555.038	1,437,730	47,793	1,849,402	150,236	4.045.056	81.40	924,429	785,810	548.673	—484,981
Atlanta & West Point	July	93	94,922	87,362	200,467	24,177	41,789	8,295	78,125	11,811	168,033	83.80	32,434	24,746	18,146	11,068
	7 mos.	93	705,456	572,168	1,455,240	189,881	336,583	56,964	603,677	82,513	1,297,616	89.20	157,624	56,836	39,173	264,129
Western of Alabama	July	133	114,422	78,142	208,783	32,576	48,871	8,786	69,742	10,972	174,251	83.40	34,532	28,373	27,495	—10,126
	7 mos.	133	768,645	513,215	1,422,900	207,744	386,248	56,582	543,136	77,818	1,295,207	91.00	127,633	68,671	82,837	219,301
Atlanta, Birmingham & Atlantic	July	639	218,660	41,757	279,342	70,336	90,755	19,582	190,743	15,212	386,650	138.42	—107,318	—125,468	—143,464	—93,136
	7 mos.	639	1,361,212	259,842	1,769,236	547,297	697,756	146,938	1,285,668	106,623	2,784,929	157.41	—1,015,693	—1,148,591	—1,164,282	—578,562
Atlantic Coast Line	July	4,887	2,949,481	1,098,785	4,402,904	732,875	1,138,949	93,196	2,283,891	128,294	4,397,252	99.90	5,652	—272,012	—215,425	—1,150,444
	7 mos.	4,887	27,165,304	10,853,869	41,018,309	5,737,315	8,642,524	682,976	19,443,668	1,013,036	35,756,132	87.20	5,252,177	3,364,311	2,613,338	650,419
Charleston & Western Carolina	July	342	196,006	46,330	252,481	72.322	57,519	6,141	140,988	7,377	284,347	112.60	—31,866	—40,617	—37,701	—51,319
	7 mos.	342	1,551,382	301,403	1,950,573	436,266	510,411	45,985	1,047,003	50,591	2,090,256	107.20	—139,683	—210,994	—260,726	—269,069
Baltimore & Ohio	July	5,184	12,862,659	2,575,212	16,537,773	2,333,000	3,831,507	255,945	6,532,449	513,790	13,604,457	82.26	2,933,316	2,328,245	2,026,781	—5,799,090
	7 mos.	5,184	88,407,366	17,311,243	112,768,724	12,431,892	25,459,385	1,878,728	52,508,932	3,874,948	97,037,238	86.05	15,731,486	11,633,186	9,657,246	—5,414,563
Baltimore & Ohio Chi. Term	July	90	.....	.....	188,608	39,497	20,291	1,435	115,236	11,364	193,190	102.43	—4,581	—42,936	70,434	—124,683
	7 mos.	90	.....	.....	1,397,266	229,552	267,133	10,188	946,902	99,484	1,581,761	113.13	—184,495	—444,105	231,980	—517,741
Staten Island Rapid Transit	July	23	74,724	143,557	253,284	64,436	18,389	2,372	122,352	13,080	220,629	87.10	32,655	17,093	5,231	—5,528
	7 mos.	23	571,904	731,281	1,450,393	275,613	195,384	13,299	891,293	93,636	1,469,225	101.30	—18,832	—114,941	—195,111	—313,347
Bangor & Aroostook	July	659	288,618	65,266	371,188	85,978	145,506	4,042	151,322	17,746	408,855	110.15	—37,667	—70,946	—53,084	—43,355
	7 mos.	659	3,441,197	556,191	4,147,348	813,468	1,122,894	31,871	1,504,621	145,058	3,655,241	88.13	492,107	242,767	302,420	263,351
Belt Ry. Co. of Chicago	July	31	.....	.....	432,371	52,626	52,335	1,043	187,820	9,544	303,368	70.20	129,003	98,741	134,059	134,970
	7 mos.	31	.....	.....	2,935,811	352,008	382,620	7,807	1,531,557	76,090	2,350,082	80.00	585,729	402,037	937,768	945,459
Bessemer & Lake Erie	July	225	1,423,942	40,450	1,488,101	90,503	430,040	13,035	385,037	24,500	951,905	64.00	536,196	504,064	494,624	693,011
	7 mos.	225	6,972,382	286,403	7,411.453	1,180,063	2,911,804	112,837	2,570,714	208,496	7,022,569	94.80	388,884	173.927	444,170	2,417,230
Bingham & Garfield	July	35	9,736	110	10,154	21,098	3,744	1,285	6,286	3,393	35,811	352.70	—25,657	—32,254	—32,122	60,506
	7 mos.	35	105.430	3,606	116,649	127,575	33,398	10,800	61,926	29,677	264.131	226.40	—147,482	—184,758	—147,519	330,591
Boston & Maine	July	2,300	3,620,471	2,262,515	6,541,142	1,043,511	1,200,201	67,883	3,428,622	239,529	6,005,997	91.80	535,145	275,907	—6,465	—1,918
	7 mos.	2,300	26,708,084	13,266,625	43,690,952	7,840,072	9,328,728	430,188	25,121,273	1,815,647	44,722.456	102.40	—1,031,504	—2,822,661	—4,491,850	—6,001,630
Brooklyn Eastern Dist. Term	July	9	95,280	.....	99,827	10.380	15,679	.....	36,875	5,003	67,937	68.06	31,890	25.436	25,356	22,070
	7 mos.	9	715.498	.....	760,894	54,438	144.827	1,468	292,712	48,450	541,895	71.22	218,999	171,793	171,813	—224,685
Buffalo & Susquehanna	July	252	117,764	5.487	126,263	36.151	64,518	2,754	49,162	9,653	162,238	128.50	—35,975	—39,275	—16,320	27,611
	7 mos.	252	1,091,240	48,970	1,161,729	273,389	640,887	21,631	460,759	74,466	1,471,132	126.60	—309,403	—332,503	—67,170	69,234
Buffalo, Rochester & Pittsburgh	July	589	872,918	154,857	1,095,166	205.096	345,361	14,003	421,186	39,308	1,027,561	93.80	67,605	31,645	53,921	—61,415
	7 mos.	589	6,804,834	1,067.701	8,223,191	1,053.888	2,668,581	125,347	3,831.992	307,586	8,005.464	97.40	217,727	—28,774	387,024	—138,113
Canadian Pacific (Lines in Me.)	July	233	95.924	36,639	147,534	52,215	41.319	3,864	77,655	3,495	178,548	121.00	—31.014	—46.014	—51,602	—61,352
	7 mos.	233	1,275.821	351,865	1,747,344	323,559	313,507	26,052	909,129	26,879	1,599,126	91.50	148,218	43,218	—55,698	—449.593
Carolina, Clinchfield & Ohio	July	291	580,947	52,230	644,954	71,198	135,328	21,020	159,643	19,975	406,815	63.08	238,139	208,111	245,968	238,860
	7 mos.	291	3,824,937	309,017	4,226,675	607.864	1,071,543	157,522	1,275.019	154,999	3,265,005	77.25	961,670	749,786	1,208,687	1,250,431
Central of Georgia	July	1,913	1,400.959	505.216	2,051,273	304.361	419.857	62,478	846.263	82,382	1,718.602	83.78	332,671	270,683	261,126	—243,843
	7 mos.	1,913	8,694,494	3,340,680	13,183,955	2,185.478	2,872,662	450,833	6,151.464	558,469	12,258,570	92.98	925,385	362.537	358,334	—306,674
Central of New Jersey	July	685	3,238,123	1,135.100	4,630,517	584.822	850.011	34,369	1,713,373	109,156	3,315,335	71.60	1,317.182	1,150,677	1,098,407	444,570
	7 mos.	685	22.739.949	5.469,227	29,780,353	3,415.302	6,114,818	241,732	13.062.592	777,404	23.758.360	79.80	6,021.993	4,325,560	4,171.917	—1,411,910
Central Vermont	July	413	395,009	97,862	540,028	143.086	151.073	10,006	272,912	20.218	598,985	110.92	—58,957	—79,893	—109,951	—152,602
	7 mos.	413	2,631.891	694.274	3,626,864	720,946	1,027,121	79,771	2,374,505	150,332	4,363.513	120.31	—736,649	—883,349	—960,366	—999,297
Chesapeake & Ohio	July	2,549	6,366,067	1,104,415	7,990,618	1,230.775	1,254,674	50,818	3,171,158	158,269	5,881,933	73.60	2,108,685	1,877,622	1,534,566	—393,450
	7 mos.	2,544	40,105,393	6,937.855	49,873.764	7,057.513	11,830,376	450,167	19,742,706	1,183,432	40,421,937	81.00	9,451,827	7,833,870	6,575,885	5,090,318
Chicago & Alton	July	1,050	1,856.832	615,912	2,630,677	455,368	711,690	57,481	985,722	58,462	2,270.059	86.30	360,618	274,216	103,714	—295,284
	7 mos.	1,050	12,142.618	3,986,691	17,097,760	2,420,141	4,856,687	361,270	7,354,615	440,204	15,499.888	90.70	1,597,872	1,017,565	58,889	—17,186
Chicago & Eastern Illinois	July	1,130	1,595,538	463,349	2,187,604	193,348	636,720	37,965	844,904	58,746	1,784,751	81.60	402,853	302,318	275,136	—613,296
	7 mos.	1,130	11,039,614	2,977,654	15,038.422	1,601,446	5,479,082	255,132	6,749.517	477,337	14.658,481	97.50	379,941	—233,994	—105,186	675,887
Chicago & North Western	July	8,402	7,624.676	3,239,725	12,215,106	1,774,318	2,004,931	176,580	5,142,599	326,437	9,489,822	77.70	2,725,284	2,029,870	1,955,965	1,269,743
	7 mos.	8,402	51,761.764	20,099,375	79,821,464	12,189,321	19,906,606	1,149,691	39,877,410	2,564,507	76,269,729	95.60	3.551,735	—1,748,154	—1,611,090	238,579
Chicago, Burlington & Quincy	July	9,393	9,842,675	3,019,115	14,028,677	1,743,637	2,529,900	180.802	5,051,579	367.094	9.991,646	71.20	4,037,031	3,246,721	3,159,255	527,547
	7 mos.	9,392	66,524,405	18,403,953	92,426.593	10,447,143	18.965,915	1,326,965	37,753,071	2,830.477	72,182,592	78.10	20.244,001	14,628.528	13,831.646	5,443.365
Chicago Great Western	July	1,496	1,401,417	426,120	1,971,692	319,006	300,624	65,730	786,619	55.184	1,542,344	78.20	429.348	376,171	244,596	—865,389
	7 mos.	1,496	9,730,474	2,893,294	13,631.578	1,752,717	2,972,352	468,378	6,109,187	430.580	11,846,828	86.90	1,784.750	1,292,768	528,743	—1,927,310
Chicago, Indianapolis & Louisville	July	657	898.679	286,167	1,287,482	167,622	321,779	30,785	484,141	33,842	1,053,580	81.80	233,902	167,929	93,750	—30,783
	7 mos.	655	5,940,800	1,919,872	8,600,671	1,009.767	2,349,431	220,207	3,588,749	254,383	7,527,808	87.50	1,072,863	649,302	92,973	—363,568
Chicago Junction	July	12	.....	.....	432,803	110,371	34,847	576	180,081	10,711	336,586	77.80	96,217	72,327	136,829	—207,848
	7 mos.	12	.....	.....	2,894,212	413,800	289,125	1,549	1,377,277	99.816	2,181,567	75.40	712,645	541,778	1,028,512	—1,008,606

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1921—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Maintenance of: Way and structure.	Equipment.	Operating expenses: Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1920
Chicago, Milwaukee & St. Paul	July	10,995	$8,297,382	$2,551,885	$12,197,540	$1,704,762	$2,555,054	$182,604	$5,111,908	$372,905	$10,008,264	82.05	$2,189,276	$1,394,498	$1,021,667	$388,391
	7 mos.	10,670	56,098,945	15,949,205	79,967,120	10,236,167	19,921,950	1,239,956	39,562,766	2,803,414	74,286,258	92.90	5,680,862	418,017	—1,794,056	—10,009,103
Chicago, Peoria & St. Louis	July	247	141,541	25,634	178,855	19,438	38,003	3,707	91,899	10,435	163,482	91.40	15,372	4,726	—6,764	—41,564
	7 mos.	247	897,975	174,644	1,135,474	199,195	381,148	32,131	734,715	83,512	1,430,701	126.00	—295,227	—362,873	—388,860	—282,718
Chicago, Rock Island & Pacific	July	7,661	8,231,167	2,660,448	11,583,048	1,599,973	2,444,543	175,270	4,463,287	228,059	8,972,438	77.50	2,610,610	2,139,611	1,811,522	—2,910,876
	7 mos.	7,661	51,720,607	17,321,144	73,896,404	9,906,757	16,712,255	1,222,556	32,175,209	1,771,215	62,152,593	84.10	11,743,811	8,605,308	6,324,946	—1,944,708
Chicago, Rock Island & Gulf	July	461	552,158	108,194	702,775	99,874	68,253	13,906	296,668	15,815	495,678	70.50	207,097	195,726	146,284	124,462
	7 mos.	461	3,276,487	736,948	4,271,170	631,982	565,848	93,434	2,038,067	114,382	3,452,582	80.80	818,588	728,829	521,879	703,371
Chic., St. Paul, Minn. & Omaha	July	1,749	1,458,727	620,065	2,260,540	309,409	301,509	34,031	1,007,669	70,970	1,732,993	76.66	527,547	391,276	392,693	308,035
	7 mos.	1,749	10,222,411	4,108,421	15,307,511	1,918,607	3,460,003	248,111	8,212,009	570,532	14,491,226	94.67	816,285	—140,144	—376,338	1,710,684
Cin., Indianapolis & Western	July	321	236,109	59,466	308,072	65,437	85,404	10,441	131,092	19,515	314,071	101.90	—5,999	—20,429	—35,446	—50,955
	7 mos.	321	1,496,855	405,722	2,005,820	415,216	664,739	81,691	1,057,591	148,853	2,384,355	118.90	—378,535	—484,880	—535,171	—482,867
Colorado & Southern	July	1,099	796,365	250,713	1,120,499	226,489	269,382	11,669	367,418	53,283	936,325	83.60	184,174	107,995	76,694	27,316
	7 mos.	1,099	5,485,655	1,358,152	7,317,254	1,002,112	1,811,756	83,045	2,702,848	371,742	6,025,420	82.30	1,291,834	760,872	832,741	838,191
Ft. Worth & Denver City	July	454	724,654	252,454	1,018,468	82,026	179,307	11,836	278,187	37,346	594,831	58.40	423,637	396,967	376,206	183,922
	7 mos.	454	4,449,452	1,514,075	6,256,721	558,862	1,214,543	81,861	2,156,169	261,888	4,317,184	69.00	1,939,537	1,743,562	1,773,651	285,900
Wichita Valley	July	255	107,760	27,080	138,920	19,478	13,772	151	40,166	1,658	75,196	54.13	63,724	57,896	48,201	—5,297
	7 mos.	255	685,105	195,636	925,762	189,734	87,903	481	373,552	11,934	662,936	71.61	262,826	222,885	151,604	30,540
Delaware & Hudson	July	880	3,357,721	406,895	3,965,073	401,964	954,135	47,781	1,298,503	150,646	2,890,945	72.91	1,074,128	994,714	1,088,531	164,033
	7 mos.	880	23,029,095	2,190,205	26,376,330	2,915,437	6,938,633	281,090	10,924,858	1,127,527	22,345,721	84.72	4,030,609	3,395,773	3,767,572	—762,986
Delaware, Lackawanna & Western	July	997	5,391,360	1,425,574	7,494,704	918,395	1,485,136	101,552	2,608,655	163,381	5,334,033	71.17	2,160,671	1,779,375	1,834,618	393,649
	7 mos.	997	36,960,032	8,284,925	49,774,689	5,696,312	11,798,085	752,376	21,123,559	1,240,802	41,000,022	82.37	8,774,667	6,101,077	6,497,114	1,006,193
Denver & Rio Grande	July	2,593	1,838,049	667,163	2,738,016	799,956	589,150	37,267	683,215	79,037	2,256,632	82.42	481,384	330,122	377,770	614,564
	7 mos.	2,590	12,297,495	3,435,910	16,978,783	3,101,189	4,455,489	280,429	6,095,124	585,268	14,859,826	87.52	2,118,957	1,080,867	1,508,872	3,732,928
Denver & Salt Lake	July	255	208,036	55,352	277,949	62,398	58,340	1,314	95,888	6,168	224,108	80.60	53,841	45,840	44,212	—68,677
	7 mos.	255	1,160,161	201,909	1,439,218	340,547	485,266	6,923	659,093	49,141	1,540,970	107.10	—101,752	—157,873	—143,769	—622,523
Detroit & Mackinac	July	385	137,174	38,493	184,110	29,033	36,512	2,856	66,538	6,158	141,053	76.61	42,957	31,909	26,323	8,307
	7 mos.	377	806,682	229,247	1,100,805	179,539	320,747	19,162	489,851	46,962	1,055,958	95.92	44,847	—38,247	—24,304	—62,012
Detroit & Toledo Shore Line	July	61	251,873	.....	256,333	29,013	31,886	2,251	51,298	5,252	119,700	46.85	136,633	122,623	86,677	—1,625
	7 mos.	61	1,402,282	.....	1,428,940	211,036	251,840	18,915	436,089	42,891	960,771	67.34	468,169	352,165	108,966	—59,337
Detroit, Toledo & Ironton	July	454	723,634	13,028	744,498	118,289	74,706	6,205	222,206	23,388	444,794	59.74	299,704	285,329	187,395	—142,967
	7 mos.	454	3,605,062	97,556	3,777,571	680,068	564,846	47,923	1,239,954	125,294	2,657,390	70.35	1,120,181	1,045,517	755,013	—374,912
Duluth & Iron Range	July	291	699,133	18,986	781,085	80,901	65,489	851	167,458	15,980	331,584	42.40	449,501	402,291	404,959	1,056,780
	7 mos.	291	2,466,893	174,763	2,909,344	677,949	762,997	9,002	1,221,535	146,291	2,822,266	97.00	87,078	—99,053	—102,665	2,076,025
Duluth, Missabe & Northern	July	409	1,846,751	49,938	2,068,604	156,509	125,786	2,644	324,319	21,547	632,377	30.60	1,436,227	1,208,177	1,203,315	2,199,265
	7 mos.	407	5,600,589	378,796	6,565,721	1,372,400	1,307,741	20,955	1,806,725	166,413	4,687,375	71.40	1,878,346	1,153,348	1,131,400	4,099,273
Duluth, South Shore & Atlantic	July	591	239,968	109,425	384,380	83,228	69,820	6,703	171,901	10,715	348,602	90.69	35,778	8,778	2,801	49,028
	7 mos.	591	1,701,493	693,842	2,636,448	495,095	642,752	49,475	1,516,988	89,507	2,843,714	107.86	—207,266	—418,387	—502,090	—236,925
Duluth, Winnipeg & Pacific	July	178	77,089	23,305	105,369	34,856	29,510	5,605	62,964	11,254	144,189	136.84	—38,820	—43,921	—46,246	—5,513
	7 mos.	178	1,226,855	222,048	1,496,356	223,612	335,351	40,226	752,627	75,681	1,427,497	95 39	68,859	—8,001	—19,096	75,199
Elgin, Joliet & Eastern	July	836	1,150,985	9	1,261,147	235,975	207,945	10,283	442,858	37,158	934,074	74.07	327,073	259,911	181,380	70,848
	7 mos.	836	10,603,000	63	11,675,448	1,325,155	3,013,320	89,843	4,064,431	287,596	8,779,678	75.20	2,895,770	2,384,090	1,506,197	925,795
El Paso & Southwestern	July	1,027	706,950	215,245	976,986	120,258	179,613	25,567	279,165	40,620	655,188	67.06	321,798	233,441	184,574	284,693
	7 mos.	1,027	5,154,681	1,466,497	6,980,003	1,186,367	1,458,246	201,104	2,193,850	346,191	5,456,161	78.17	1,523,842	873,634	644,704	1,908,526
Erie R. R.	July	1,989	6,476,240	1,438,243	8,503,539	1,109,640	2,210,672	128,143	4,081,927	263,407	7,847,889	92.30	655,650	353,077	553,222	—1,940,385
	7 mos.	1,989	45,518,337	8,352,884	58,100,024	6,397,922	17,478,488	909,279	27,343,851	2,143,943	54,795,171	94.30	3,304,853	1,251,714	3,042,098	—9,483,485
Chicago & Erie	July	269	595,261	80,653	715,131	122,009	123,648	19,040	507,531	39,320	812,355	113.60	—97,224	—141,025	—580,537	—300,385
	7 mos.	269	5,163,860	492,465	6,040,314	763,607	1,038,814	135,636	3,611,934	294,316	5,846,620	96.79	193,694	—112,632	—2,766,135	—1,636,363
New Jersey & New York	July	47	18,809	114,510	135,769	28,344	15,862	1,454	57,847	3,022	106,529	78 46	29,240	26,323	—2,265	—3,313
	7 mos.	47	127,457	705,150	855,759	102,292	133,305	12,129	480,122	18,601	746,444	87.23	109,315	88,775	—103,614	—153,709
N. Y., Susquehanna & Western	July	135	257,701	53,165	347,950	73,446	37,200	3,698	201,384	10,070	325,798	93.60	22,152	—3,681	—051	—113,780
	7 mos.	135	1,745,282	459,425	2,505,391	352,672	348,223	27,748	1,601,073	69,242	2,398,953	95.80	106,438	—74,911	—45,918	—659,317
Florida East Coast	July	764	424,616	206,031	725,385	214,964	193,413	9,604	311,123	31,862	738,255	101.80	—12,870	—116,581	—145,468	10,191
	7 mos.	764	5,072,725	2,819,999	9,021,050	1,587,638	1,569,558	100,231	3,283,260	213,137	6,825,446	75.70	2,195,604	1,750,775	1,454,614	2,004,210
Fort Smith & Western	July	253	80,352	25,428	113,744	26,701	26,088	4,738	53,111	6,747	118,483	104.10	—4,738	—9,865	—16,097	7,041
	7 mos.	253	750,984	179,074	1,027,656	266,983	255,185	36,054	444,434	53,687	1,070,170	104.10	—42,514	—81,259	—117,968	—36,095
Georgia R. R.	July	328	276,616	118,978	417,192	43,414	83,623	17,717	229,860	20,191	395,041	94.70	22,151	16,189	20,293	—52,673
	7 mos.	328	2,073,939	785,366	3,053,458	330,109	767,142	139,433	1,708,138	148,549	3,094,673	101.40	—41,215	—83,125	—46,216	—147,371
Georgia & Florida	July	405	101,556	17,705	128,260	29,714	17,258	7,745	64,747	7,514	127,215	99.58	1,045	—6,819	—22,187	—114,565
	7 mos.	405	638,238	120,254	819,663	199,602	143,167	52,426	428,214	57,170	882,273	107.51	—62,610	—117,907	—171,513	—590,475
Grand Trunk Western	July	352	966,358	238,631	1,274,609	237,138	262,411	32,549	552,194	53,077	1,144,191	89.80	130,418	74,859	—65,193	—302,540
	7 mos.	352	6,463,969	1,289,400	8,184,395	1,139,707	1,736,469	244,505	4,104,784	456,087	7,724,413	94.40	459,982	85,703	—964,113	—823,479
Atlantic & St. Lawrence	July	166	87,253	48,220	145,749	97,347	36,611	2,880	108,051	10,232	256,252	175.80	—110,503	—129,708	—156,864	—118,810
	7 mos.	166	1,292,065	294,707	1,719,220	438,420	289,242	22,539	1,011,515	106,069	1,872,095	108.80	—152,875	—288,429	—760,855	—1,059,201
Chi., Det. & Canada Gr. Tr. Jct.	July	62	92,875	10,088	117,864	15,337	21,348	2,638	61,298	4,251	105,015	89.10	12,849	6,434	—11,115	5,340
	7 mos.	62	916,423	100,827	1,081,340	105,206	132,520	18,575	479,284	34,550	770,944	71.30	310,396	272,154	136,767	—100,484
Detroit, Grand Haven & Milwk.	July	194	409,540	42,559	477,485	58,280	68,618	9,973	193,128	16,414	346,915	72.70	130,570	124,323	74,130	—31,755
	7 mos.	194	1,804,988	322,395	2,271,453	354,914	397,010	69,528	1,459,430	130,846	2,414,805	106.30	—143,352	—182,557	—594,360	—788,210

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1921—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Maintenance of: Way and structure.	Equipment.	Operating expenses: Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1920.
Great Northern	July	8,159	$5,573,319	$1,624,754	$8,142,962	$1,127,957	$1,887,487	$138,332	$2,960,604	$222,905	$6,445,894	79.20	$1,697,068	$1,013,275	$1,073,147	$628,264
	7 mos.	8,164	35,068,773	9,550,875	50,046,749	8,369,125	11,595,132	985,791	22,727,780	1,734,336	45,654,483	91.20	4,392,266	—774,433	—538,012	1,791,728
Green Bay & Western	July	252	80,715	16,160	104,625	23,696	19,893	1,639	39,267	2,709	87,092	83.20	17,533	9,733	7,069	—526
	7 mos.	252	612,057	128,788	794,923	131,288	177,875	12,590	309,222	22,282	653,136	82.10	141,787	90,959	78,864	—4,815
Gulf Coast Lines	July	920	537,204	204,086	782,681	156,756	116,425	22,943	264,023	36,624	595,557	76.09	187,124	150,939	134,961	—252,388
	7 mos.	920	4,650,354	1,454,096	6,457,450	1,254,397	1,116,125	191,899	2,200,781	293,280	5,041,064	78.07	1,416,386	1,164,995	901,679	68,458
Gulf & Ship Island	July	307	165,041	49,582	233,981	41,324	43,206	5,677	83,536	11,870	186,001	79.40	47,980	27,721	32,316	—44,220
	7 mos.	307	1,197,181	315,866	1,625,455	309,537	318,776	47,182	633,711	95,612	1,407,301	86.50	218,154	80,771	88,488	—173,540
Gulf, Mobile & Northern	July	463	262,249	42,990	319,441	56,217	53,030	13,252	146,928	12,848	282,275	88.40	37,166	14,873	5,337	—172,094
	7 mos.	463	1,962,358	300,475	2,368,767	433,757	498,264	87,142	1,128,053	108,596	2,255,812	95.20	112,955	—13,449	—65,632	—534,283
Hocking Valley	July	350	1,149,156	108,558	1,355,653	183,579	332,582	9,911	424,457	33,314	983,781	72.50	371,872	294,328	227,380	—269,225
	7 mos.	350	6,513,589	748,286	7,736,526	1,082,505	3,136,277	75,555	2,894,276	253,068	7,440,580	96.20	295,946	—295,815	—252,984	599,609
Illinois Central	July	4,799	8,479,887	2,326,115	11,565,130	1,882,846	2,910,519	154,315	3,944,640	292,592	9,256,033	80.00	2,309,097	1,624,414	1,740,991	425,019
	7 mos.	4,799	60,514,021	14,693,152	80,441,877	11,660,981	18,118,423	1,078,717	32,322,956	2,175,177	65,813,986	81.80	14,627,891	9,961,019	10,819,955	4,850,014
Yazoo & Miss. Valley	July	1,381	1,073,059	357,925	1,503,486	332,664	382,246	23,339	632,095	58,599	1,415,676	94.20	87,810	—31,856	—35,956	—30,147
	7 mos.	1,381	8,462,606	2,429,870	11,497,666	2,340,830	2,434,106	177,789	5,254,019	389,981	10,584,745	92.10	910,921	144,233	113,317	—22,818
International & Great Northern	July	1,159	1,160,911	265,457	1,587,616	226,894	348,043	24,727	700,956	51,045	1,353,807	85.27	233,809	194,795	95,869	—142,288
	7 mos.	1,159	8,363,765	1,839,867	11,061,580	1,619,563	2,217,169	180,003	5,823,649	382,489	10,274,270	92.88	787,310	528,867	—328,091	—1,630,143
Kansas City, Mexico & Orient	July	272	128,312	17,076	152,812	25,770	34,195	5,531	74,649	11,004	151,149	98.30	1,663	—6,377	—1,477	—68,420
	7 mos.	272	835,014	93,494	986,144	232,225	320,975	39,476	535,784	92,124	1,220,584	123.80	—234,440	—290,752	—266,087	—409,533
Kans. City, Mex. & Orient of Tex.	July	465	175,341	21,878	202,562	30,294	45,510	5,085	102,325	5,721	188,935	93.30	13,627	7,477	—11,574	—91,772
	7 mos.	465	1,044,221	124,146	1,219,100	305,282	380,541	38,888	769,056	47,167	1,540,934	126.40	—321,834	—364,909	—484,784	—545,162
Kansas City Southern	July	779	1,309,791	209,981	1,622,148	201,275	281,794	34,374	527,831	70,926	1,115,843	68.80	506,305	428,568	412,999	1,540
	7 mos.	779	9,508,171	1,371,346	11,618,514	1,444,077	1,998,442	278,189	4,262,938	522,794	8,495,168	73.10	3,123,346	2,582,453	2,483,967	892,487
Texarkana & Ft. Smith	July	93	138,748	17,685	170,655	27,754	15,043	5,793	54,244	7,784	112,615	66.00	58,040	50,631	38,255	—1,494
	7 mos.	93	1,028,599	125,855	1,261,386	138,580	149,374	34,881	472,467	57,482	854,276	67.70	407,110	355,531	181,805	265,560
Kansas City Terminal	July	27	.....	.....	147,391	17,964	15,047	.....	47,457	3,276	86,237	58.51	61,154	34,644	255,668	185,965
	7 mos.	27	.....	.....	905,104	116,679	142,427	.....	380,415	25,395	684,144	75.59	220,960	35,181	1,559,071	1,256,257
Kansas, Oklahoma & Gulf	July	314	185,282	12,234	205,465	43,298	27,221	4,142	78,827	10,358	164,002	79.80	41,463	32,302	28,634	3,295
	7 mos.	319	1,170,756	114,369	1,353,338	348,369	247,649	29,095	618,468	75,643	1,320,564	97.60	32,775	—31,027	—90,787	—248,570
Lake Superior & Ishpeming	July	33	24,013	93	30,117	15,525	8,896	312	10,248	2,423	37,404	124.20	—7,287	—12,645	—12,105	194,095
	7 mos.	33	82,754	1,587	104,256	125,371	123,164	1,888	71,805	23,244	345,472	331.40	—241,216	—279,663	—275,684	324,683
Lake Terminal	July	13	.....	.....	74,543	8,057	9,988	.....	35,599	132	53,776	72.10	20,767	15,030	22,619	—11,509
	7 mos.	13	.....	.....	772,163	107,795	146,433	.....	447,025	1,139	702,392	91.00	69,771	27,978	35,719	—142,942
Lehigh & Hudson River	July	96	259,067	3,729	271,269	26,481	34,897	1,676	104,007	6,534	173,595	64.00	97,674	85,523	64,101	—22,637
	7 mos.	96	1,770,012	27,780	1,865,976	189,767	299,046	13,831	818,895	53,457	1,374,996	73.70	490,980	405,919	249,999	—97,049
Lehigh & New England	July	237	375,739	2,227	399,970	65,423	89,144	7 255	120,922	17,161	299,905	75.00	100,065	84,612	86,807	143,047
	7 mos.	237	2,487,459	15,012	2,610,705	373,570	623,416	39,766	931,045	118,561	2,086,156	79.90	524,549	416,378	503,487	527,297
Lehigh Valley	July	1,448	5,073,584	819,397	6,259,984	716,472	1,870,782	96,231	2,395,817	135,276	5,242,019	83.70	1,017,965	925,069	909,706	—737,741
	7 mos.	1,448	37,729,519	4,519,450	43,102,024	4,612,305	16,306,440	734,997	19,017,420	1,022,202	41,859,851	97.10	1,242,173	54,885	84,091	—7,178,883
Los Angeles & Salt Lake	July	1,168	967,877	524,563	1,626,089	396,259	357,870	46,337	540,331	32,311	1,429,924	87 90	196,165	89,172	45,977	368,760
	7 mos.	1,168	7,239,209	3,405,565	11,590,155	2,482,160	2,388,062	358,031	4,038,199	255,943	9,848,536	85.00	1,741,619	1,073,762	768,772	2,103,750
Louisiana & Arkansas	July	302	207,971	37,013	251,415	45,058	84,189	6,020	82,649	7,710	225,441	89.70	25,974	9,626	2,931	44,242
	7 mos.	202	1,634,568	245,664	1,935,296	376,595	467,464	43,095	706,445	62,104	1,653,699	85.40	281,597	165,298	111,617	500,811
Louisiana Ry. & Nav. Co	July	343	266,462	36,513	316,373	49,693	22,761	10,269	113,470	12,006	207,855	65.60	108,518	92,463	60,324	—31,600
	7 mos.	343	1,789,730	242,549	2,162,756	478,138	285,686	70,751	907,423	88,946	1,828,812	84.50	333,944	221,159	73,121	—86,513
Louisville & Nashville	July	5,043	7,075,558	2,008,818	9,610,560	1,528,919	2,515,592	174,464	3,927,673	228,361	8,406,100	87.50	1,204,460	934,022	869,369	—881,972
	7 mos.	5,043	49,590,720	13,749,679	67,214,699	10,889,500	20,482,413	1,474,453	31,238,128	1,837,978	66,093,304	98.30	1,121,395	—978,280	—1,719,844	1,456,027
Louisville, Henderson & St. Louis	July	199	143,147	67,042	222,035	46,999	42,908	5,702	78,929	8,121	182,659	82.27	39,376	31,965	18,633	47,028
	7 mos.	199	1,056,991	439,313	1,629,021	324,024	314,744	46,749	638,620	63,565	1,387,702	85.19	241,319	189,598	89,815	189,582
Maine Central	July	1,215	924,559	500,382	1,550,690	311,660	336,999	14,562	714,838	39,931	1,428,581	92.10	122,109	16,550	5,791	—818,517
	7 mos.	1,215	8,398,681	2,822,027	12,027,462	2,402,299	3,494,173	93,494	6,369,281	348,245	12,726,012	105.80	—698,550	—1,437,911	—1,620,702	—2,044,604
Midland Valley	July	388	248,498	73,491	334,774	69,489	48,359	4,336	119,507	14,538	255,102	76.20	79,672	71,506	70,703	—132,209
	7 mos.	388	1,910,019	564,300	2,586,072	603,790	459,961	34,834	928,591	143,850	2,167,661	83.80	418,411	361,230	328,640	155,436
Minneapolis & St. Louis	July	1,650	879,413	177,867	1,128,940	192,317	299,453	23,158	574,180	44,103	1,133,157	100.40	—4,217	—87,674	—129,553	—389,154
	7 mos.	1,650	7,046,483	1,353,888	8,820,974	1,317,377	2,352,929	175,386	4,791,675	313,627	8,951,272	101.50	—130,298	—672,201	—813,207	—878,331
Minn., St. Paul & S. S. Marie	July	4,242	2,330,660	857,070	3,534,772	644,837	596,525	60,679	1,463,129	106,590	2,896,537	81.95	638,235	374,641	325,614	716,264
	7 mos.	4,242	16,330,496	4,717,612	22,913,515	4,179,140	5,920,304	373,001	11,657,666	795,438	23,075,426	100.71	—161,911	—2,144,144	—2,560,985	1,049,514
Mississippi Central	July	1	55,813	26,541	86,413	34,624	30,230	3,140	34,311	6,436	108,741	125.93	—22,328	—28,010	—32,986	—23,297
	7 mos.	1	437,614	139,198	599,829	131,010	221,088	19,344	228,468	48,963	648,873	108.18	—49,044	—93,776	—94,402	—274,917
Missouri, Kansas & Texas	July	1,714	1,996,204	615,402	2,836,169	422,856	621,252	43,572	858,459	84,242	2,035,768	71.80	800,401	644,531	743,706	204,077
	7 mos.	1,715	13,261,080	4,186,623	18,840,412	2,553,652	5,402,553	341,982	6,756,221	696,603	15,755,580	83.60	3,084,832	2,150,862	2,883,641	1,952,331
Mo., Kans., & Tex. of Tex	July	1,739	1,604,584	598,969	2,385,009	285,904	371,380	40,949	777,609	85,264	1,572,198	65.90	812,811	762,832	588,152	—913,365
	7 mos.	1,739	10,450,426	3,978,674	15,585,115	2,183,918	2,778,685	303,504	6,480,451	674,555	12,515,960	80.30	3,069,155	2,729,408	1,099,455	—5,685,067
Wichita Falls & Northwestern	July	328	336,586	36,134	380,594	46,538	31,531	798	97,350	6,132	181,349	47.60	199,245	188,345	164,367	—22,096
	7 mos.	328	1,226,555	212,582	1,505,588	257,940	229,615	7,090	563,769	51,999	1,110,124	73.70	395,464	319,136	178,109	—473,574

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1921—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues			Maintenance of		Operating expenses				Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals, 1920.
			Freight.	Passenger.	Total (inc. misc.)	Way and structure.	Equipment.	Traffic.	Transportation.	General.	Total.					
Missouri Pacific	July	7,300	$6,557,955	$1,679,494	$8,959,260	$1,583,595	$1,993,371	$173,397	$3,446,754	$264,052	$7,489,699	83.60	$1,469,561	$1,125,575	$798,175	—$78,764
	7 mos.	7,300	45,227,425	11,347,208	61,360,215	10,970,216	13,714,882	1,172,729	26,834,435	2,043,476	54,926,086	89.51	6,434,129	4,285,497	2,869,694	1,267,009
Mobile & Ohio	July	1,165	1,058,867	159,423	1,296,751	187,424	399,789	36,913	547,395	46,141	1,218,735	94.00	78,016	2,206	—21,651	—350,871
	7 mos.	1,165	8,914,573	1,095,522	10,538,313	1,507,875	3,003,593	323,888	4,634,028	367,803	9,846,295	93.40	692,018	287,675	230,669	—851,410
Columbus & Greenville	July	226	52,549	26,359	85,307	30,669	12,797	1,654	50,210	7,167	102,497	120.10	—17,190	—30,853	—48,850	—119,134
	7 mos.	267	605,602	197,951	855,119	271,069	137,372	23,142	515,257	44,851	991,691	116.00	—136,572	—234,589	—386,374	—464,554
Monongahela	July	106	270,729	34,969	309,223	52,560	64,670	1,384	95,023	8,285	221,922	71.77	87,301	80,801	44,104	—53,547
	7 mos.	106	1,907,167	255,949	2,194,396	535,099	497,460	13,913	723,634	59,355	1,829,461	83.37	364,935	319,435	—28,419	—519,521
Monongahela Connecting	July	7	.....	.....	43,030	7,758	10,091	506	22,957	5,198	46,510	108.10	—3,480	—5,081	—9,050	32,977
	7 mos.	7	.....	.....	413,095	64,216	96,622	3,809	235,959	43,557	444,163	107.5	—31,068	—43,520	—74,871	297,577
Montour	July	56	107,520	833	109,685	33,836	37,076	986	26,026	7,422	105,346	.96	4,339	660	22,360	35,277
	7 mos.	56	892,077	7,529	913,470	189,701	415,931	7,919	251,759	51,229	916,593	1.00	—3,123	—29,724	141,427	94,246
Nashville, Chatt. & St. Louis	July	1,258	1,291,056	452,429	1,853,173	183,292	361,413	62,487	717,161	53,051	1,381,634	74.5	471,539	421,748	431,550	—750,001
	7 mos.	1,258	8,107,852	2,994,607	11,949,311	1,939,408	3,187,441	493,653	5,763,425	400,387	11,822,722	98.9	126,589	—231,662	69,288	461,077
Nevada Northern	July	164	12,329	2,839	15,695	9,711	3,782	322	5,607	2,954	22,379	142.58	—6,684	—16,467	—13,063	61,889
	7 mos.	164	157,594	40,447	223,438	79,319	46,773	3,990	98,789	23,794	252,917	113.19	—29,479	—98,157	—79,540	324,164
Newburgh & South Shore	July	7	.....	.....	81,553	9,213	20,674	.....	36,567	3,788	70,242	86.10	11,311	1,579	2,759	—37,753
	7 mos.	7	.....	.....	730,495	83,654	177,962	.....	374,652	31,163	667,431	91.40	63,064	—4,665	14,684	—236,344
New Orleans Great Northern	July	274	152,620	56,258	217,644	34,738	45,875	4,302	83,742	10,402	179,542	82.49	38,102	21,803	—7,804	22,057
	7 mos.	274	1,104,996	310,167	1,478,292	241,789	268,553	37,529	636,682	70,090	1,257,763	85.08	220,529	110,441	72,825	137,949
New York Central	July	6,078	15,107,825	8,401,862	26,295,230	3,281,145	5,710,656	283,966	9,509,030	746,868	19,909,780	75.72	6,385,450	4,769,049	4,744,511	—2,296,130
	7 mos.	6,076	109,857,268	53,695,405	183,821,842	20,656,873	42,753,024	2,260,842	77,056,009	5,758,933	151,241,149	82.28	32,580,693	21,091,423	21,948,674	—6,222,863
Cincinnati Northern	July	244	295,014	21,089	326,003	53,545	63,027	3,866	102,760	7,430	230,481	70.70	95,522	77,695	64,494	11,681
	7 mos.	245	1,876,830	132,480	2,078,666	320,291	399,503	36,272	763,854	52,496	1,572,002	75.63	506,664	397,233	353,239	73,664
Cleve., Cin., Chic. & St. Louis	July	2,410	4,184,011	1,551,358	6,242,501	901,170	1,509,605	94,778	2,406,633	164,606	5,137,637	82.30	1,104,864	788,636	757,014	—28,361
	7 mos.	2,416	32,132,925	10,138,759	45,836,267	6,129,195	10,112,039	773,090	20,470,709	1,181,124	39,045,949	85.19	6,789,318	4,540,415	3,453,217	4,014,445
Indiana Harbor Belt	July	120	.....	.....	675,529	60,313	121,092	2,911	242,446	20,334	447,096	66.20	228,433	210,482	61,633	—926,528
	7 mos.	120	.....	.....	5,078,284	661,512	989,935	26,353	2,394,328	182,425	4,254,693	83.80	823,591	665,023	—26,967	—2,672,766
Kanawha & Michigan	July	176	352,732	59,360	429,781	81,088	120,847	3,867	125,753	12,475	344,028	80.05	85,753	54,848	68,266	55,902
	7 mos.	176	2,190,730	419,597	2,710,645	508,374	1,051,940	27,558	987,443	78,072	2,653,360	97.89	57,285	—184,216	118,515	135,315
Lake Erie & Western	July	738	612,362	52,701	704,020	141,874	173,148	20,431	293,676	24,756	653,870	92.90	50,150	2,386	2,385	—116,524
	7 mos.	738	4,494,844	410,455	5,158,380	888,998	1,393,650	134,257	2,440,285	196,544	5,052,899	98.00	105,481	—243,491	—261,951	—323,801
Michigan Central	July	186	3,701,473	1,889,148	6,346,834	635,423	1,603,388	80,471	2,113,927	119,095	4,666,445	73.53	1,680,389	1,455,006	1,514,302	—407,910
	7 mos.	186	25,156,575	11,760,441	40,831,059	4,905,520	8,368,252	674,209	17,420,582	1,053,440	32,964,630	80.73	7,866,429	6,295,488	6,323,766	592,276
Pittsburgh & Lake Erie	July	224	1,172,801	259,664	1,521,252	251,298	545,333	26,366	594,547	62,678	1,482,225	97.43	39,027	—223,854	24,169	—676,913
	7 mos.	224	11,005,891	1,827,976	13,881,396	2,240,576	4,042,717	151,601	5,727,028	516,593	12,688,708	91.41	1,192,688	—340,525	1,313,483	—1,674,465
Toledo & Ohio Central	July	503	805,297	80,762	929,761	144,124	243,014	10,316	304,491	26,358	731,538	78.68	198,223	141,866	158,731	—93,944
	7 mos.	503	5,140,906	539,681	5,924,290	1,026,190	1,376,653	75,958	2,476,331	202,595	5,177,183	87.39	747,107	358,210	584,080	—112,542
New York, Chicago & St. Louis	July	574	1,932,126	157,040	2,128,542	250,370	430,910	54,598	773,902	69,670	1,584,558	74.40	543,984	408,053	372,751	556,399
	7 mos.	574	14,138,999	827,962	15,248,849	1,564,057	3,130,907	385,636	6,408,444	513,527	12,034,234	78.90	3,214,615	2,486,213	2,389,685	2,669,417
N. Y., New Haven & Hartford	July	1,986	4,450,530	4,652,406	10,046,886	1,856,929	2,134,891	61,737	4,205,279	305,729	8,736,263	86.95	1,310,623	914,925	485,255	—4,039,341
	7 mos.	1,986	29,427,621	29,156,500	65,101,888	10,041,361	16,308,435	429,142	33,595,304	2,456,557	64,097,367	98.46	1,004,521	—1,779,334	—4,251,487	—8,810,873
Central New England	July	301	642,628	24,049	693,315	121,464	92,041	3,514	212,760	14,216	443,995	64.04	249,320	227,627	149,377	—467,122
	7 mos.	301	4,436,981	175,965	4,802,982	731,759	712,062	27,367	1,876,619	105,155	3,453,367	71.90	1,349,615	1,192,244	682,346	—2,122,698
New York, Ontario & Western	July	569	647,768	819,678	1,655,942	203,746	291,529	12,286	515,882	26,977	1,050,420	63.43	605,522	569,993	528,461	414,546
	7 mos.	569	5,083,024	1,942,480	8,135,797	1,037,041	2,052,368	99,818	3,603,799	233,056	7,026,082	86.36	1,109,715	860,906	726,063	—65,835
Norfolk & Western	July	2,231	5,583,837	905,993	6,787,348	981,930	1,488,415	63,955	2,278,087	144,967	4,962,550	73.10	1,824,798	1,434,543	1,666,532	—525,108
	7 mos.	2,221	38,226,372	5,879,329	45,978,419	6,778,345	11,331,245	501,323	18,920,945	1,102,317	38,731,506	84.20	7,246,913	4,513,313	6,033,918	—90,068
Norfolk Southern	July	942	469,267	182,020	689,400	119,432	109,919	22,002	272,245	31,930	556,106	80.70	133,294	100,619	99,685	—154,507
	7 mos.	942	3,398,479	944,329	4,620,807	747,787	721,039	158,770	2,204,021	231,821	4,066,035	88.00	554,772	327,953	261,875	—287,044
Northern Pacific	July	6,655	5,342,515	1,789,238	7,877,354	1,293,576	1,685,810	131,120	2,848,838	218,389	6,313,616	80.15	1,563,738	823,582	974,889	11,086
	7 mos.	6,655	33,392,981	10,104,092	48,304,574	9,344,832	11,854,045	856,929	21,217,501	1,751,831	45,731,084	94.67	2,573,490	—2,505,083	—860,776	5,634,961
Northwestern Pacific	July	507	466,331	379,469	958,643	109,956	72,874	5,120	303,055	14,393	507,726	.....	450,917	404,323	385,340	265,186
	7 mos.	503	2,359,109	1,717,038	4,649,417	852,628	569,723	44,359	1,938,138	118,846	3,539,769	.....	1,109,649	879,714	825,664	663,484
Pennsylvania R. R.	July	7,323	26,601,950	11,745,797	41,231,622	5,243,530	8,339,492	430,755	17,562,948	1,081,406	33,357,337	80.90	7,874,285	5,699,244	4,880,247	97,152
	7 mos.	7,323	189,054,184	77,159,979	289,816,545	34,723,563	75,597,315	3,180,334	128,846,206	8,083,473	255,404,042	88.10	34,412,503	23,425,162	17,920,836	—38,231,435
Balti., Chesapeake & Atlantic	July	87	120,617	73,732	201,014	8,934	22,356	2,844	91,515	3,975	129,624	64.50	71,390	59,699	64,417	4,705
	7 mos.	87	640,924	255,882	920,272	97,489	244,111	11,584	550,558	28,028	931,770	101.20	—11,498	—34,045	—31,548	—195,506
Cin., Lebanon & Northern	July	76	95,000	8,658	111,880	18,356	21,513	2,084	98,311	2,907	143,177	128.00	—31,297	—39,999	—41,435	20,086
	7 mos.	76	553,800	58,565	642,761	119,835	166,995	12,664	457,682	22,110	779,270	121.20	—136,509	—197,183	—205,602	—135,730
Cumberland Valley & Martinsburg	July	33	135,000	6,526	140,623	13,581	14,034	670	16,123	2,166	46,574	33.10	94,049	90,110	85,322	4,477
	7 mos.	33	812,300	45,899	873,581	77,669	147,401	4,933	262,590	14,888	507,481	58.10	366,100	346,238	308,827	—73,043

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1921—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structure.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals, 1920.
Grand Rapids & Indiana	July	575	$411,000	$262,132	$715,124	$82,835	$172,939	$16,672	$410,836	$24,329	$708,910	99.10	$6,214	—$29,589	—$47,232	—$60,677
	7 mos.	575	3,147,190	1,298,139	4,801,162	506,493	1,191,298	103,040	2,746,886	175,990	4,728,135	98.50	73,027	—177,602	—328,324	—429,356
Long Island	July	398	649,569	2,440,940	3,315,432	256,451	375,342	22,651	1,141,678	58,191	1,871,108	55.40	1,444,324	1,187,648	1,048,389	695,281
	7 mos.	398	4,332,112	10,365,840	16,082,566	2,000,250	3,093,992	131,493	8,166,624	446,705	13,970,319	86.90	2,112,247	1,331,822	1,004,857	—587,046
Maryland, Dela. & Va	July	82	81,762	65,036	150,529	9,308	41,067	2,967	84,382	2,216	139,940	93.00	10,589	3,974	—1,314	1,925
	7 mos.	82	469,101	197,732	690,194	81,130	158,201	8,876	472,218	18,190	738,615	107.00	—48,421	—61,270	—75,752	—221,486
N. Y., Phila. & Norfolk	July	122	435,000	110,297	600,207	42,479	149,888	7,235	323,289	12,384	548,430	91.40	51,777	23,008	—13,240	28,337
	7 mos.	122	2,650,300	712,660	3,672,564	363,152	1,016,985	58,308	2,324,652	100,133	3,953,101	107.60	—280,537	—425,650	—546,585	—568,834
Pitts., Cin., Chi. & St. Louis	July	2,383	4,546,300	2,007,322	7,344,059	1,140,616	1,718,266	103,047	3,660,360	214,335	6,905,655	94.00	438,404	28,450	—237,117	—167,766
	7 mos.	2,383	35,933,700	13,556,576	55,521,700	7,601,176	16,223,293	860,436	26,504,177	1,669,577	53,339,122	96.10	2,182,578	—680,692	—2,906,653	—2,841,335
West Jersey & Seashore	July	359	346,200	1,277,377	1,689,818	176,433	136,589	16,335	607,090	25,859	974,046	57.60	715,772	539,028	510,515	315,203
	7 mos.	359	2,002,082	4,756,709	7,233,796	1,177,780	1,330,710	94,368	3,871,851	180,658	6,721,164	92.90	512,632	168,167	49,572	—961,998
Peoria & Pekin Union	July	19	17,106	2,341	122,141	9,809	38,520	145	47,371	7,715	103,560	84.78	18,581	7,672	26,545	—41,722
	7 mos.	19	103,749	17,858	952,753	120,515	231,931	921	544,438	45,191	942,996	98.97	9,757	—77,200	60,629	—122,755
Pere Marquette	July	2,227	2,421,957	681,191	3,353,879	306,008	756,334	47,006	1,144,174	97,716	2,360,745	70.39	993,134	899,341	815,120	506,877
	7 mos.	2,237	15,292,780	3,443,356	20,307,546	2,431,056	4,428,568	337,131	9,159,211	772,747	17,193,592	84.67	3,113,954	2,294,607	1,947,164	—481,691
Philadelphia & Reading	July	1,126	5,601,786	935,764	6,811,224	824,068	1,653,944	61,454	2,542,675	156,726	5,257,230	77.20	1,553,994	1,414,565	1,203,077	—715,270
	7 mos.	1,126	40,641,932	6,526,690	49,132,949	5,804,046	13,744,447	408,775	20,985,160	1,183,743	42,288,527	86.10	6,844,422	5,353,811	3,901,337	—1,139,868
Atlantic City	July	177	127,677	610,103	753,214	58,094	64,221	4,610	278,874	1,179	406,999	54.00	346,215	326,680	266,262	212,581
	7 mos.	177	765,005	1,801,778	2,618,447	417,830	377,774	22,518	1,490,806	14,525	2,324,087	88.80	294,360	160,102	—56,953	55,138
Perkiomen	July	41	91,098	13,597	108,036	10,718	3,867	13	38,803	395	53,824	49.80	54,212	44,859	37,680	30,795
	7 mos.	41	657,021	69,002	754,333	66,613	28,341	102	269,539	3,127	367,865	48.80	386,468	358,251	319,924	217,982
Port Reading	July	21	88,134	.....	129,822	26,690	3,819	18	60,624	490	91,659	70.60	38,163	21,564	—27,570	—33,893
	7 mos.	21	954,407	.....	1,336,525	144,553	44,884	126	523,880	9,166	722,607	54.10	613,918	515,856	94,811	—429,658
Pittsburgh & Shawmut	July	102	68,957	3,626	74,005	18,392	30,239	1,261	28,233	6,994	85,119	115.00	—11,114	—18,925	—2,363	52,575
	7 mos.	102	637,886	42,369	691,235	170,953	293,464	13,820	271,766	51,619	801,622	115.30	—110,387	—119,130	65,172	345,899
Pittsburgh & West Virginia	July	63	122,318	12,580	163,985	72,872	57,617	3,120	48,067	64,267	259,079	157.99	—95,094	—116,578	—114,617	—3,148
	7 mos.	63	804,186	86,780	1,114,057	282,949	378,323	14,361	428,240	121,288	1,306,467	117.27	—192,410	—333,678	310,912	207,815
Pittsburgh, Shawmut, Northern	July	210	78,724	5,922	86,957	23,300	35,766	1,568	38,744	5,706	105,095	120.80	—18,138	—20,386	—19,872	—59
	7 mos.	210	617,787	51,171	683,169	188,335	345,354	10,889	334,139	49,953	928,708	135.80	—245,539	—261,229	—145,306	—24,821
Quincy, Omaha & Kansas City	July	252	73,191	23,739	107,603	66,146	23,870	926	48,073	—1,128	137,453	127.70	—29,850	—84,000	—38,534	—63,342
	7 mos.	253	498,492	181,627	735,867	247,405	122,625	6,346	423,835	16,999	815,174	110.80	—79,307	—108,823	—135,147	—262,170
Richmond, Fred. & Potomac	July	117	467,465	256,280	818,324	79,573	131,349	7,833	315,959	26,206	570,345	69.70	247,979	210,406	174,446	237,157
	7 mos.	117	3,292,847	2,238,681	6,215,709	961,136	1,039,195	59,488	2,627,103	204,086	5,012,511	80.14	1,203,198	961,394	659,753	1,478,414
Rutland	July	415	231,899	151,678	484,328	97,529	97,387	8,918	205,969	12,907	424,533	.....	59,795	34,972	43,906	—21,958
	7 mos.	415	1,842,975	862,751	3,278,970	655,375	751,757	60,574	1,588,740	104,645	3,174,254	.....	104,716	—63,319	43,635	—406,485
St. Louis-San Francisco	July	4,760	4,264,164	1,873,727	6,568,500	733,096	1,148,452	77,672	2,509,008	193,863	4,650,753	70.80	1,917,747	1,615,210	1,541,947	—1,379,141
	7 mos.	4,760	31,458,192	12,219,662	46,518,888	5,188,228	8,736,256	598,365	19,216,209	1,503,866	35,024,877	75.30	11,494,011	9,526,108	9,412,305	4,376,247
Ft. Worth & Rio Grande	July	235	84,717	40,728	136,679	20,973	23,110	2,852	63,304	6,162	115,476	84.50	21,203	17,506	9,051	—148,955
	7 mos.	235	589,200	299,815	969,173	248,811	176,072	23,335	590,206	50,379	1,086,615	112.10	—117,442	—142,967	—220,350	—370,470
St. Louis, San Fran. & Tex	July	134	176,599	16,515	198,404	32,997	26,489	3,008	70,217	6,973	139,684	70.40	58,720	56,717	27,436	—92,338
	7 mos.	134	893,873	128,440	1,054,171	269,860	217,349	22,838	588,961	47,393	1,146,217	108.70	—92,046	—105,586	—333,096	—398,382
St. Louis Southwestern	July	968	1,128,351	147,149	1,332,032	208,544	211,818	44,314	366,527	52,922	891,629	66.90	440,403	374,755	356,111	558,762
	7 mos.	968	8,171,447	1,060,530	9,627,020	1,178,604	1,620,282	332,872	2,859,256	396,116	6,436,882	66.90	3,190,138	2,810,040	2,594,762	3,858,722
St. Louis Southwestern of Tex	July	807	489,330	114,019	641,922	161,819	151,859	21,245	314,339	32,352	681,282	106.10	—39,360	—63,401	—52,688	—263,732
	7 mos.	807	3,226,239	714,253	4,255,635	1,071,193	1,191,061	147,689	2,332,972	256,796	5,003,642	117.60	—748,007	—916,674	—822,496	—1,377,844
San Antonio & Aransas Pass	July	738	418,709	109,636	556,762	97,989	97,616	9,376	233,838	23,042	460,873	82.77	95,889	82,228	81,446	24,669
	7 mos.	738	2,566,941	604,443	3,370,101	768,980	736,610	70,422	1,824,767	175,891	3,573,094	106.02	—202,993	—297,762	—280,026	—633,799
San Antonio, Uvalde & Gulf	July	317	59,522	26,685	99,095	12,530	11,960	2,713	31,652	5,957	64,812	65.44	34,283	31,666	23,917	—110,079
	7 mos.	317	460,052	176,031	718,593	100,441	112,878	21,419	282,571	46,428	563,737	78.45	154,856	134,970	60,459	—327,728
Seaboard Air Line	July	3,563	2,022,083	818,837	3,173,979	370,466	738,442	132,975	1,508,161	144,206	2,918,554	91.95	255,425	104,379	4,881	—1,270,598
	7 mos.	3,563	17,253,847	5,913,471	25,352,190	2,978,568	4,577,271	882,842	12,810,599	1,065,760	22,578,348	89.06	2,773,842	1,714,809	647,664	—3,558,883
Southern Ry.	July	6,971	6,707,981	2,939,207	10,387,467	1,547,166	1,910,736	217,889	4,479,280	323,952	8,568,585	82.50	1,818,882	1,412,638	1,163,008	1,098,862
	7 mos.	6,971	47,710,988	18,663,957	72,804,252	11,883,933	14,050,648	1,494,228	33,897,730	2,415,900	64,386,464	88.40	8,417,788	5,877,411	3,306,955	8,958,423
Alabama Great Southern	July	313	514,639	195,366	751,734	104,562	149,377	25,167	314,879	25,944	626,464	87.33	125,270	98,206	105,320	261,117
	7 mos.	313	3,921,242	1,200,882	5,456,175	828,607	1,166,424	156,566	2,569,824	171,011	4,940,979	91.11	515,196	330,791	349,986	1,402,074
Cin., New Orleans & Tex. Pac	July	338	1,012,028	294,732	1,378,618	201,240	316,613	33,430	516,591	40,090	1,116,877	81.01	261,741	210,315	247,273	551,504
	7 mos.	338	7,490,353	2,102,768	10,205,876	1,413,908	2,505,697	208,603	4,378,793	290,770	8,878,166	86.99	1,327,710	979,669	1,024,186	2,427,295
Georgia So. & Florida	July	402	272,515	72,746	388,756	77,890	79,935	9,007	209,869	12,408	390,609	100.50	—1,853	—19,006	—50,799	—135,867
	7 mos.	402	1,771,404	598,099	2,616,878	593,104	581,536	61,807	1,530,145	90,097	2,875,991	109.90	—259,113	—379,312	—557,016	59,025

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1921—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structure.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals, 1920.
New Orleans & Northeastern	July	207	$348,693	$94,851	$485,963	$86,536	$103,049	$14,202	$224,132	$18,635	$451,540	92.92	$34,423	—$17,763	—$12,366	$106,672
	7 mos.	207	2,794,186	641,391	3,747,350	636,088	740,900	88,401	1,872,223	120,148	3,488,763	93.10	258,587	—52,073	—177,000	434,888
Northern Alabama	July	110	43,923	12,559	58,296	20,447	3,296	1,895	30,972	3,331	59,941	102.80	—1,645	—954	—13,166	—24,198
	7 mos.	110	390,474	93,868	503,140	126,029	33,160	13,500	260,271	24,036	456,996	90.80	46,144	22,506	—67,684	—52,083
Southern Pacific	July	7,110	10,593,925	4,440,391	16,574,383	2,435,197	2,674,764	221,257	5,830,151	443,612	11,924,180	71.90	4,650,203	3,699,494	3,335,974	3,754,150
	7 mos.	7,110	67,466,176	29,725,927	108,541,722	15,421,681	19,249,729	1,533,440	42,314,198	3,300,921	83,901,366	77.30	24,640,356	18,033,134	16,683,183	15,745,571
Arizona Eastern	July	382	127,165	28,501	176,424	36,942	34,594	2,917	72,012	21,365	169,467	96.10	6,957	9,243	—154	49,525
	7 mos.	382	1,333,898	284,861	1,763,422	330,003	307,985	26,023	673,228	154,380	1,517,346	86.00	246,076	91,944	17,783	357,740
Atlantic S. S. Lines	July	...	724,017	51,373	809,897	16,773	353,331	16,998	454,565	32,651	874,318	107.90	—64,421	—75,944	—190,692	—501,317
	7 mos.	...	5,234,289	418,431	5,959,416	102,095	1,442,416	121,761	3,883,991	200,338	5,750,529	96.50	208,887	128,194	18,925	—3,017,090
Gal., Harrisburg & S. Ant.	July	1,380	1,201,969	503,898	1,818,413	419,018	379,099	39,966	749,558	78,293	1,679,273	92.35	139,140	94,293	30,867	—295,962
	7 mos.	1,380	10,388,739	3,252,759	14,650,265	2,736,008	2,109,835	334,536	5,924,338	578,869	12,772,435	87.18	1,877,830	1,573,462	861,062	—1,502,127
Houston & Tex. Central	July	932	763,661	260,317	1,101,335	299,420	148,627	23,470	398,739	36,204	905,975	82.26	195,360	166,788	137,230	—57,644
	7 mos.	932	5,163,683	1,626,311	7,173,207	1,972,359	1,184,180	147,298	2,969,341	241,118	6,509,182	90.74	664,045	371,018	101,156	—292,178
Houston, East & West Texas	July	191	190,648	53,812	258,196	62,861	33,472	3,535	89,094	7,978	196,932	76.27	61,264	81,236	72,153	—87,410
	7 mos.	191	1,195,492	339,639	1,611,826	428,734	229,080	24,687	710,899	52,918	1,446,091	89.72	165,735	137,724	47,293	—364,236
Louisiana Western	July	207	251,344	101,388	379,004	56,604	81,828	9,211	110,519	16,550	279,803	73.80	99,201	75,284	72,480	89,193
	7 mos.	207	1,630,311	684,506	2,476,292	389,851	548,286	77,650	819,634	116,255	1,982,855	80.10	493,437	304,219	286,070	607,412
Morgan's La. & T. R. R. & S. S. Co.	July	400	467,100	173,310	691,958	143,236	197,548	15,533	273,711	30,873	666,773	96.40	25,185	—5,432	—23,622	—115,715
	7 mos.	400	3,505,124	1,167,533	4,987,305	1,181,998	1,179,637	121,237	2,258,571	216,854	4,995,998	100.20	—8,693	—316,839	—540,861	571,255
Texas & New Orleans	July	475	501,600	164,788	709,639	161,137	185,090	10,146	269,942	32,070	663,321	93.47	46,318	25,723	—1,715	—49,684
	7 mos.	475	3,602,456	1,094,524	4,963,436	1,132,846	1,445,414	82,201	2,249,015	184,264	5,136,165	103.48	—172,729	—315,146	—548,475	—303,277
Spokane International	July	...	84,899	16,045	105,613	27,924	10,300	3,007	31,584	5,798	79,410	75.20	26,203	18,576	12,136	39,454
	7 mos.	...	598,461	111,451	738,729	151,712	58,043	22,065	257,733	43,049	537,376	72.80	201,353	150,361	107,534	254,871
Spokane, Portland – Seattle	July	549	414,770	183,411	653,258	85,177	73,344	10,303	215,169	20,414	414,431	63.44	238,827	143,572	118,797	—5,278
	7 mos.	549	2,747,690	1,063,396	4,184,135	521,487	615,562	61,716	1,567,546	156,936	2,983,778	71.31	1,200,357	598,037	539,611	593,349
Tennessee Central	July	292	107,495	59,686	178,526	48,739	37,624	4,443	84,459	10,550	185,814	104.10	—7,288	—12,118	—18,905	—40,996
	7 mos.	292	925,556	351,631	1,356,922	312,438	281,418	33,261	759,811	79,339	1,466,218	108.10	—109,296	—143,044	—268,337	—182,365
Term. R. R. Assn. of St. Louis	July	37	.....	.....	346,192	92,301	47,053	936	123,831	8,703	276,631	79.90	69,561	22,691	136,941	128,951
	7 mos.	37	.....	—9	2,522,522	598,177	259,132	7,134	963,174	63,958	1,917,419	76.00	605,103	271,360	1,057,684	966,811
East St. Louis Connecting	July	3	.....	.....	123,363	17,618	12,724	333	54,490	3,256	88,421	71.70	34,942	32,086	22,809	—49,772
	7 mos.	3	.....	.....	931,850	142,649	50,110	2,503	453,958	24,837	674,057	72.30	257,793	237,234	155,091	—273,630
St. Louis Mchts. Bridge Term.	July	9	.....	.....	277,296	42,116	29,879	936	145,852	6,082	224,865	81.10	52,431	36,402	54,934	—75,298
	7 mos.	9	.....	.....	2,019,880	326,451	183,135	7,061	1,184,528	48,347	1,749,522	86.60	270,358	165,821	277,975	—334,299
St. Louis Transfer Ry.	July	6	.....	.....	88,204	8,267	5,934	196	30,895	1,816	47,108	53.40	41,096	39,556	34,792	4,642
	7 mos.	6	.....	.....	654,276	70,345	29,110	1,472	259,728	13,665	374,320	57.20	279,956	276,075	243,251	128,121
Texas & Pacific Ry.	July	1,952	1,803,809	728,420	2,711,116	407,083	344,315	46,929	987,849	92,692	1,897,913	70.00	813,203	684,481	614,620	237,281
	7 mos.	1,949	13,916,174	5,250,816	20,551,607	3,632,961	4,097,039	369,740	8,484,688	703,647	17,487,468	85.10	3,064,139	2,166,436	1,433,898	467,858
Toledo, Peoria & Western	July	247	78,163	39,794	127,807	28,699	31,583	3,382	72,067	7,391	143,176	112.03	—15,369	—25,369	—24,552	—27,888
	7 mos.	247	531,289	333,509	935,122	231,348	314,476	23,016	589,727	57,591	1,217,420	130.19	—282,298	—352,486	—322,853	38,751
Toledo, St. Louis & Western	July	454	666,440	38,688	736,597	133,174	120,734	21,049	266,353	14,822	556,103	75.50	180,494	144,494	110,972	17,748
	7 mos.	454	4,658,414	214,786	5,094,485	830,246	1,135,571	143,822	1,971,652	112,818	4,193,818	82.30	900,667	658,118	492,078	496,928
Trinity & Brazos Valley	July	368	244,205	20,450	271,330	56,985	34,372	2,489	102,905	10,252	206,743	76.20	64,587	57,387	37,369	—24,860
	7 mos.	368	1,389,960	127,299	1,568,613	351,935	338,225	20,636	677,628	72,044	1,459,627	93.10	108,986	59,946	—61,242	—398,385
Ulster & Delaware	July	128	79,529	137,997	249,235	18,829	25,429	4,824	100,063	7,890	157,631	63.20	91,604	84,867	75,655	—34,634
	7 mos.	128	452,204	296,551	933,814	127,626	170,765	22,945	525,284	58,856	910,250	97.50	23,564	—25,576	—57,936	—190,792
Union R. R. of Pa.	July	45	.....	.....	733,869	66,969	234,167	185	281,916	6,530	589,688	80.40	144,181	136,515	183,285	37,888
	7 mos.	45	.....	.....	5,719,053	437,748	1,625,602	1,824	2,877,136	55,483	4,997,714	87.40	721,339	650,922	1,030,784	176,586
Union Pacific	July	3,614	6,686,057	1,854,424	9,317,262	1,243,113	1,962,340	155,951	2,621,816	310,263	6,481,358	69.60	2,835,904	2,305,774	2,148,395	376,157
	7 mos.	3,614	41,153,284	11,423,558	58,023,239	6,107,647	12,423,362	1,040,683	18,317,291	2,289,070	41,416,638	71.40	16,612,601	13,054,926	12,302,080	13,386,165
Oregon Short Line	July	2,359	1,783,123	583,541	2,590,599	502,154	569,783	39,892	855,302	125,529	2,154,686	83.20	435,913	151,069	102,566	96,000
	7 mos.	2,359	13,018,963	3,617,480	18,243,276	3,087,304	3,939,383	303,571	6,494,243	887,740	15,100,621	82.80	3,142,655	1,301,731	1,083,370	5,433,166
Oregon-Wash. R. R. & Nav. Co.	July	2,223	1,353,005	594,841	2,141,709	505,006	370,315	55,827	916,300	125,690	2,004,736	93.60	136,973	—43,833	—148,805	—221,548
	7 mos.	2,223	10,557,475	3,695,622	15,631,698	3,356,747	2,849,070	424,441	6,848,374	945,183	14,659,301	93.80	972,397	—295,949	—891,313	1,386,410
St. Joseph & Grand Isl.	July	258	255,131	30,358	303,956	116,870	45,278	2,976	118,718	11,518	295,360	97.20	8,596	—4,260	—21,470	—147,863
	7 mos.	258	1,486,284	212,036	1,814,079	376,870	341,384	18,994	856,764	102,775	1,696,709	93.50	117,370	27,402	—92,728	—373,783
Utah	July	98	58,262	711	65,584	28,885	22,586	309	27,684	4,202	82,992	126.54	—17,408	—25,456	—35,510	50,416
	7 mos.	98	612,723	3,781	626,445	148,038	239,577	2,509	179,408	27,750	582,760	93.98	37,685	—19,958	—65,850	359,705
Virginian	July	526	1,324,992	101,538	1,549,525	242,413	262,388	9,940	424,234	28,295	951,485	62.10	588,040	482,304	483,160	411,096
	7 mos.	526	9,779,980	564,001	11,146,174	1,406,281	2,205,305	73,682	3,310,884	218,166	7,202,547	64.60	3,943,627	3,252,651	3,399,463	1,972,940
Wabash	July	2,472	3,670,218	916,750	4,862,653	898,884	962,705	111,900	2,037,014	164,204	4,207,638	86.50	655,015	503,650	237,998	—1,028,288
	7 mos.	2,472	25,941,167	5,861,731	33,694,921	5,501,796	6,930,611	791,503	15,231,643	1,254,659	29,928,047	88.80	3,766,874	2,740,360	1,128,175	—6,236,765
Western Maryland	July	804	1,210,634	130,527	1,402,315	171,089	291,049	30,662	488,621	46,779	1,044,896	74.50	357,419	297,419	256,249	—207,770
	7 mos.	798	9,249,843	688,838	10,535,650	1,288,157	2,549,534	195,843	4,070,391	361,183	8,614,621	81.80	1,921,029	1,511,029	1,720,742	—392,635
Western Pacific	July	1,011	660,947	280,818	1,017,930	216,680	186,131	29,084	371,645	32,938	858,822	84.37	159,108	64,343	78,258	513,196
	7 mos.	1,011	4,708,997	1,467,356	6,573,620	1,249,500	1,379,606	221,150	2,641,906	295,295	5,928,647	90.19	644,973	105,205	426,861	1,856,342
Wheeling & Lake Erie	July	511	1,274,907	87,206	1,477,255	207,858	313,576	12,400	457,950	35,210	1,030,965	69.80	446,290	369,816	318,907	209,280
	7 mos.	511	7,407,056	577,306	8,226,180	1,125,816	1,882,283	98,477	3,323,700	281,492	6,740,671	81.90	1,485,509	953,291	769,130	87,043

Mail Car Robberies Reduced

Postmaster-General Hays is quoted as saying that the wave of post office and mail train robberies had been broken by the order issued last April that all post office clerks engaged in the transportation of mail arm themselves. There has been a slump in the losses since the clerks began carrying pistols and shotguns in mail cars, wagons and post offices. In 1920, the Post Office Department lost $6,300,000 because of robberies, but in the five months from April 7, when arming was ordered, until September 7, only $88,580 was stolen.

The Equipment Quarterly

A list of traffic representatives of large shippers is a prominent feature of the August issue of the "Railway Equipment Quarterly," the 185-page supplement to the Railway Equipment Register. This list fills 34 pages, and information is given from 44 states, together with a few items from Canada. The list has been compiled primarily to show names of shippers and receivers of carload freight in large quantities. An idea of the detail included may be gained from the statement that New York fills nearly five pages. This includes, however, under New York City, the National Wholesale Lumber Dealers' Association, in which there are over 500 members, and the names and addresses of all these members are given. The Fisk Rubber Company, of Chicopee Falls, Mass., has branches in over 100 cities, all of which are named.

The classification of freight cars, which is a main feature of the Quarterly, has been greatly enlarged and now contains an enormous mass of details. A new section has been added, Part IV, Private Cars, filling seven pages. This gives the names of manufacturers, merchants and other shippers who own cars, with the figures distributed in 20 columns to show the kinds of cars. This list shows a total of 190,422 cars; which indicates that the total number of such cars in the country must be well above 200,000; for some prominent owners, like the American Refrigerator Transit Company, Morris & Company and Swift & Company, have given no information as to the number of cars owned by them.

The total number of tank cars recorded in this list is 124,479; refrigerators 36,306 and hopper (coal) cars 18,039.

National Safety Council at Boston

The National Safety Council, headquarters 168 North Michigan avenue, Chicago, announces the tenth annual congress of the Council, to be held at Boston, Mass., in the State House, beginning Monday, September 26, and continuing five days. The general business meeting will be held on Monday morning, C. P. Colman, president of the National Safety Council, presiding. The section meetings will be held on the following days, the more important ones in the forenoon.

The steam railroad section, T. H. Carrow (Penn.), chairman, will hold its first session on Tuesday morning, in room 436. The speakers named in the program are John F. Moore (Y. M. C. A.), Rev. Walt Holcomb, C. W. Galloway (B. & O.), and E. L. Bair, Benefit Association of Railway Employees, Chicago.

The second session, Wednesday morning, will discuss bulletin No. 78 of the Interstate Commerce Commission, containing statistics of railroad accidents of the last quarter of 1920. Train accidents will be discussed by F. R. Mitchell (N. Y., N. H. & H.), S. G. Watkins (B. & M.), and T. R. McCampbell (C. C. C. & St. L.); train service accidents by C. L. La Fountaine (G. N.), W. J. Orr (T. H. & B.), D. E. Satterfield (C. & O.), and E. M. Harris (N. Y., N. H. & H.); non-train accidents by W. H. Ganzert (C. & O.), E. S. Chapin (Penn.), H. E. Astley (N. Y., N. H. & H.), and J. T. Pratt (P. & R.).

The third session will be a joint meeting with the Electric Railway Section, on Thursday morning, with John T. Broderick (B & O.) in the chair. The discussion will be on highway grade crossing accidents, and the following are the speakers: J. E. Long (D. & H.), F. M. Metcalfe (N. P.), T. P. Brennan (L. I.), F. Whittemore (N. C. & St. L.), Arthur Ridgeway (D. & R. G. W.), D. L. Cease ("The Railroad Trainman"), and L. F. Shedd (C. R. I. & P.).

On Friday morning there will be an address by F. M. Metcalfe (N. P.) on the substitution of superintendents' staff meetings for the customary safety committee meetings. Other speakers on Friday will be D. G. Phillips (Wabash), Harry A. Adams (U. P.), F. H. Babcock (P. & L. E.), and E. R. Cott (H. V.).

Disastrous Floods in Texas

Heavy rains in southern Texas on September 9 and 10, featured by a cloudburst near San Antonio, caused serious loss of life and extensive damage to property in the city of San Antonio and vicinity. There also was considerable damage to railroad property. Bridge approaches have been washed out at many points. The Missouri, Kansas & Texas lost approximately 500 ft. of bridge approaches between Temple and Taylor, and the line between Austin and Ranger was closed many days. Between Ranger and Georgetown this road lost approaches to 14 or 15 bridges, while at three or four points as many as 10 to 20 panels were washed away. In the immediate vicinity of San Antonio the damage to the railroads was not so great. The Southern Pacific had a few washouts. Several small washouts occurred on that road between Austin and Elgin. Other damage is reported on the Llano & Austin branch, and some damage to trestle bridges and the San Gabriel river bridge on the Llano branch. Heavy rains have occurred on the watershed of the Little river which joins the Brazos north of Herne, and in that vicinity water was over the track in numerous places. Heavy rains fell farther south, and the Texas-Mexican, between Corpus Christi and Laredo, suffered heavy damage. The waters receded rapidly and it is expected that all train service will be restored by the end of this week. Until that time it will be necessary for the Missouri, Kansas & Texas to run trains to San Antonio by way of Houston.

Railway Returns for July

The net railway operating income for July of the 202 class I railroads of the United States amounted to $69,485,000, which is a larger sum than they have earned in any month since last October, according to the reports filed with the Interstate Commerce Commission. It also represents an increase of $17,000,000 as compared with June.

The earnings for July, on the basis of the tentative valuation fixed by the Interstate Commerce Commission for rate-making purposes under the transportation act, would be at the annual rate of return of 4½ per cent. This is $23,782,000 for the month less than the roads should have earned as the normal July proportion of a 6 per cent return, which would be $93,267,000. Fifty-seven of the roads failed to earn their operating expenses and taxes for the month. In June, 72 of the roads failed to earn expenses and taxes.

The total operating revenues for July amounted to $462,953,000, which was a decrease of $66,000,000, or 12½ per cent, as compared with July, 1920, although the rates are now on a higher basis. Operating expenses were $362,776,000, a reduction of $151,000,000, or 29.4 per cent. The net operating income compares with a deficit of $11,878,000 for July, 1920.

The large reduction in expenses is attributable to several factors. It reflects the effect of the reduction in wages ordered by the Railroad Labor Board, effective on July 1, but it also represents the effect of the drastic curtailment of maintenance expenditures, and it is to be borne in mind that the figures for last July, with which comparison is made, included some back wage payments.

For the 11 months since September 1, 1920, when the guaranty period expired, the net operating income of the class I roads has been $438,000,000, which on the basis of the tentative valuation would be at the annual rate of return of 2.6 per cent, or $570,000,000 less than a 6 per cent return.

For the roads of the Eastern district for July the operating revenues were $208,043,000, a decrease of 13.8 per cent, while the expenses were $167,007,000, a decrease of 32.5 per cent. The net operating income of the Eastern roads was $27,336,000, as compared with a deficit last year.

The Southern roads had operating revenues amounting to $71,202,000, a decrease of 10 per cent; their expenses were $58,988,000, a decrease of 26.1 per cent, and their net operating income was $8,368,000, as compared with a deficit last year.

For the Western district the operating revenues were $183,708,000, a decrease of 11.8 per cent; the operating expenses were $136,781,000, a decrease of 26.7 per cent, and the net operating income was $33,781,000, as compared with $9,104,000 in July, 1920.

Traffic News

Nearly 7,000,000 more bushels of grain passed down the Lachine Canal in August than during the same month last year, according to figures issued by the Lachine Canal office. Wheat totalled 5,361,846 bushels gain; 6,662,592 bushels in August, 1921, against 1,300,747 bushels in August, 1920. Corn showed 2,918,266 bushels coming down last month, against 116,946 bushels last year. Oats, rye and flaxseed also record increases.

The Pennsylvania Railroad announces that beginning September 15, the extra fare of $7.78 (including war tax) between Washington and Chicago on the Broadway Limited will be discontinued. Beginning September 25 a through sleeping car from Chicago to Washington will be run on train No. 136, leaving Chicago at 11:30 p. m., and one from Washington to Chicago on the train leaving Washington at 10:30 p. m. These changes are to meet the competition of the Baltimore & Ohio, which has put on a new train between Washington and Chicago, competing with the Broadway Limited in time, but charging no extra fare.

Rates on Building Materials Reduced

The Interstate Commerce Commission on September 10 approved heavy reductions, on five days' notice, in interstate freight rates on sand, gravel and crushed stone between practically all points in trunk line territory, including Pennsylvania, New Jersey, Delaware, Maryland and portions of West Virginia and Virginia. The new rates will go into effect on October 1 and will be approximately 15 per cent higher than the rates in effect prior to the general increase of August, 1920, thus substituting a 15 per cent increase for a 40 per cent increase. Builders of roads, buildings, etc., will have the benefit of an annual reduction in transportation charges much in excess of a million dollars.

Western Livestock Rates To Be Reduced

The Interstate Commerce Commission on September 13 granted the western carriers authority to waive the usual tariff rules requiring publication of specific rates in order to permit reduced rates on livestock in the west to become effective September 20. In its opinion the commission recommended that c. l. rates on cattle, hogs and sheep, west of the Mississippi river and Chicago, now higher than 50 cents per 100 lb., be reduced by 20 per cent, except that no rates need be reduced below 50 cents. Practically all rates from points west of the Missouri river to Chicago and from west of the Rocky Mountains to the Missouri river will be reduced in amounts ranging from 1 to 25 cents per 100 lb. In many cases the entire increase made in August, 1920, will be eliminated. The amount of reduction in the carriers' annual revenue which will result is not definitely known, but has been estimated to be upwards of $10,000,000, the commission's announcement said.

Anthracite Shipments, August, 1921

Shipments of anthracite for August, as reported to the Anthracite Bureau of Information, in Philadelphia, amounted to 5,575,115 gross tons, as compared with 5,462,760 tons in the preceding month, and with 6,207,653 tons in August, 1920. The decrease from August, 1920, was due chiefly to continued light demand for all sizes except stove, and to a continuance of scattered colliery suspensions caused by market conditions and petty strikes.

Shipments by originating carriers were:

	August, 1921	July, 1921
P. & R. R. W.	1,116,844	1,039,078
L. V. R. R.	924,649	946,387
C. R. R. of N. J.	544,007	507,942
D., L. & W. R. R.	953,014	926,850
D. & H. Co.	756,982	691,132
Penna. R. R.	360,817	384,780
Erie R. R.	628,280	619,365
N. Y., O. & W. R. W.	98,355	110,605
L. & N. E. R. R.	192,167	236,621
	5,575,115	5,462,760

Commission and Court News

Interstate Commerce Commission

The commission has announced the reopening of the Kansas intrastate rate case for further hearing with reference to specific intrastate rates in Kansas that may be higher than interstate rates to and from Kansas points.

The commission has suspended from September 15 until January 13, 1922, the operation of schedules which propose increased commodity rates on fresh fruits, melons and vegetables, in carloads, from points in Arkansas, Louisiana, Missouri, Oklahoma and Texas to destinations in Central Freight Association and Trunk Line Territories.

The commission has further suspended until October 29, the operation of certain schedules which propose to increase rates on lumber and other commodities between El Paso, Tex., and points in Oregon, Washington, Utah and Idaho, the operation of which was suspended until September 29 by an order previously entered.

The commission has suspended until January 11, 1922, the operation of certain schedules published by the Lehigh Valley, which propose the cancellation of the existing commodity rate of 12½ cents per 100 lb. on lumber from North Tonawanda, N. Y., to Canandaigua, leaving applicable instead the existing sixth-class rate of 14½ cents.

The commission has suspended until January 24, 1922, the operation of certain schedules published by the Southern Pacific which propose the cancellation of certain exceptions to the Western Classification applicable on fresh fruit and vegetables on interstate traffic between points in Arizona, New Mexico and Texas, resulting in the application of first, second and third class rates on apples, first class on bananas, melons, oranges, and third class on potatoes, l. c. l., fifth class on apples, third class on bananas and oranges, and Class C rates on melons and potatoes, c. l., in lieu of the existing ratings of fourth class, l. c. l., and Class C on carloads.

The commission has suspended from September 10 until January 8, 1922, the operation of certain schedules published in Agent R. H. Countiss' trans-continental east bound tariff which propose the cancellation of routing on lumber and other forest products from points on the South Bend (Washington) Branch of the Chicago, Milwaukee & St. Paul, via Marengo, Wash., to destinations on the Union Pacific System in Southern Idaho, Utah and Western Wyoming, resulting in the application of combination of locals. For example, the present through rate from Doty, Wash., to Nampa, Idaho, is 52½ cents, while the combination rate proposed to apply is 56½ cents.

The commission has suspended from September 15 until January 13, 1922, the operation of certain schedules published by R. H. Countiss, agent. The suspended schedules in Supplement No. 1 to the tariff propose to restrict the routing on lumber and articles taking same rates destined to eastern points so as not to apply via any junction in connection with the Atchison, Topeka & Santa Fe, Gulf, Colorado & Santa Fe or Pan-Handle & Santa Fe, from points in California, Nevada and Utah in the Hawley and Truckee groups, leaving applicable instead combination rates, and Supplement No. 2 to the tariff proposes to substitute for the combinations proposed to apply, the coast group rates from points in the Hawley and Truckee groups.

State Commissions

The Baltimore & Ohio has filed an application with the Illinois State Commission for permission to close four stations in that state, the stations being Lakewood, Moccasin, Bluff Springs and Berry.

Foreign Railway News

Simplon Tunnel Widening Completed

The excavation work on the second Simplon tunnel in Switzerland, parallel to the first, was completed on September 13, according to cable dispatches from Geneva. The masonry work on the new tunnel is said to be well advanced and it is expected that it will be open for traffic by the first of the year.

Disastrous Accident on French Railway

Twenty-five persons are reported to have been killed and 60 injured when an express train bound from Lyons to Strassbourg was derailed 9 miles from Lyons, on September 10. Four cars carrying third class passengers were overturned. Passengers in these cars were for the most part soldiers returning for duty to Alsace.

Electrification of the Argentine Transandine

The directors of the Argentine Transandine Railway have asked authority to increase the capital of the company from 2,500,000 to 4,000,000 gold pesos, according to Commerce Reports, the additional funds to be used in covering the expense of electrifying the line. Plans are said to be under way providing for the joint operation of the Chilean Transandine with the Argentine Transandine.

Belgians Underbid Americans in China

Bids by Belgian concerns on steel rails for the Peking-Mukden Railway are equivalent to $41 a ton, according to Commerce Reports. These bids are from $7 to $32 lower than bids by American concerns. The Belgian bids were the lowest and two French concerns came second and third. The Yellow River Bridge Commission has recommended the awarding of the business to the Belgians.

Purchasing Department Changes on Japanese Government Railways

The financial and purchasing department of the Japanese Government Railways has organized a new section for the purpose of making extensive purchases of modern labor-saving machinery for the mechanical and engineering departments. This section, which will be under the direction of Shinji Sogo, will also arrange for the purchase and installation of modern equipment for the railway's offices.

South African Railway Electrification May Be Postponed

The latest reports regarding the proposals for the electrification of certain sections of the government railways of the Union of South Africa are to the effect that no bids have as yet been accepted, and that it is possible that the program may not be carried through at this time to the full extent planned for, according to Commerce Reports. It is reported that uncertain business conditions may influence the government to defer this work.

Improved Railway Service for Rumania

Representatives from the ministry of railways of Rumania recently met in Prague to discuss the means of establishing rapid train service between Czechoslovakia, Rumania, and other southeastern European countries, says a report from Consul C. S. Winans, Prague, Czechoslovakia. A general conference on this question is to be held at Prague in October. The negotiations recently held at Budapest between Czechoslovakia and Hungary regarding the rates to be charged on merchandise sent to Rumania by way of Hungary are said to have reached a favorable conclusion.

Equipment and Supplies

Locomotives

THE CHILEAN STATE RAILWAYS, reported in the *Railway Age* of April 29, as inquiring for 30 Mikado type locomotives, has ordered 10 Mikado type locomotives from the Baldwin Locomotive Works, and 20 Mikado type locomotives from the American Locomotive Company.

Freight Cars

THE BINGHAM & GARFIELD is asking for prices on 25 to 75 ore cars of 60 tons' capacity.

THE ATLANTIC FRUIT COMPANY, New York, has ordered 4 flat cars of 20-ton capacity from the Magor Car Corporation.

THE DENVER & RIO GRANDE WESTERN is inquiring for 1,000, 50-ton flat bottom gondola cars, also for 1,000, 70-ton flat bottom gondola cars.

THE WABASH has given an order to the Western Steel Car & Foundry Company, for making repairs to 200 to 250 all steel hopper cars, of 40-ton capacity.

THE VIRGINIAN contemplates having repairs made on from 1,000 to 4,000 freight cars. 100 freight cars are now being repaired at the shops of the Mt. Vernon Car Manufacturing Company.

THE BANGOR & AROOSTOOK, reported in the *Railway Age* of September 3, as inquiring for 200 single sheathed box cars of 40-ton capacity, has ordered these cars from the Standard Steel Car Company.

THE CHICAGO, ROCK ISLAND & PACIFIC, reported in the *Railway Age* of August 27, as inquiring for 200 gondola cars and also asking for bids for the repair of 500 all steel general service cars, has ordered 200 composite gondola cars of 50-tons capacity from the General American Car Company and is having repairs made to 125 general service gondola cars of 50-ton capacity at the shops of the Western Steel Car & Foundry Co.

Iron and Steel

THE CANADIAN PACIFIC has ordered 25,000 tons of rail, from the Algoma Steel Corporation.

THE EVANSVILLE, INDIANAPOLIS & TERRE HAUTE has ordered from the Mt. Vernon Bridge Company, Mt. Vernon, Ill., 200 tons of steel for its Eel river bridge in Indiana.

THE MEIKI RAILWAY, Osaka, Japan, is inquiring through Mitsui & Company, New York, for 1,900 tons of 60-lb. rail; Mitsui & Co. are also inquiring for about 1,000 tons additional of 30-lb. and 60-lb. rail for export to Japan.

Miscellaneous

THE MISSOURI KANSAS & TEXAS has awarded a contract to the National Boiler Washing Company, Chicago, for unloading and delivery facilities, pumps, oil columns, pipe lines, etc., for use with oil tanks the orders for which were noted in the *Railway Age* of September 10 (page 510).

THE NEW YORK CENTRAL will receive bids until 12 o'clock, noon, September 29, for its present requirements on rolled steel gears, fence wire, track bolts, volt cable and parts for installing same, bottom plates for crossing frogs, manganese frogs; its requirements of fuel oil for locomotive service during whatever period of time during the month of October, 1921, it is required to burn same and its requirements until October 31, 1921, on steel billets and steel wheels for locomotive, passenger car and tender repairs.

Supply Trade News

R. I. Baird, who was from 1909 to 1917 connected with the sales department of the Electric Storage Battery Company, Philadelphia, Pa., has returned to the service of that company and is now in charge in the western district of sales of Exide batteries for railway car lighting, industrial trucks, etc. Mr. Baird's headquarters will be at the Chicago office of the company, in the Marquette building. The railway signal work is in charge of **H. B. Crantford,** who formerly was in the service of the Chicago, Milwaukee & St. Paul. Mr. Baird was educated at the Armour Institute of Technology, Chicago, and has been connected with the Automatic Electric Company and the Bryant Zinc Company. He was also in railroad work, having served in the signal department of the Illinois Central. Since 1917, he has represented the Delco Light Company, in Montana.

R. I. Baird

Charles B. Seger, president of the **United States Rubber Company,** New York, has been elected also chairman of the board, succeeding as chairman Col. Samuel P. Colt, deceased. Mr. Seger was born on August 29, 1867, at New Orleans, La., and was for many years in railway service, having begun work as an office boy with Morgan's Louisiana & Texas Railroad & Steamship Company, now a part of the Southern Pacific. He subsequently served as a clerk until 1887, when he was appointed steamship auditor. He was then auditor and later clerk to the chief auditor until 1893, when he was appointed auditor and secretary of the Galveston, Harrisburg & San Antonio, the Texas & New Orleans and the Direct Navigation Company. In January, 1900, he was appointed also auditor and secretary of the Galveston, Houston & Northern. On November 1, 1904, he was appointed auditor of the Southern Pacific—Pacific system, with office at San Francisco, Cal., and six years later became general auditor of the Southern Pacific-Union Pacific systems, later serving as deputy controller until the separation by the courts of the Southern and Union Pacific systems in 1913, when Mr. Seger became vice-president and controller of the Union Pacific and from March to December, 1918, served as acting chairman of the executive committee and as president. Since January 1, 1919, he has been president of the United States Rubber Company and now becomes also chairman of the board as above noted.

C. B. Seger

The **Pennsylvania Car Company** has been incorporated under the laws of Delaware, with a capital of $1,000,000 to engage in the building of railroad cars. The incorporators are: J. H. Van Moss, James H. Durbin, L. B. Coppinger, and the Corporation Trust Company of Delaware. Plants equipped with latest improved machinery will be constructed at Sharon, Pa., at Argentine station, Kansas City, Kan., and at Houston, Texas. This company is affiliated with the interests that control the Pennsylvania Tank Car Company and the Pennsylvania Tank Line, Sharon, Pa., and the present plans call for the development of one of the largest organizations of its kind in the country.

The **Railroad Accessories Corporation,** manufacturer of and dealer in general railway supplies, particularly those used by the signal departments, with offices at 50 Church street, New York, and factory at Boonton, N. J., has succeeded to the rights and property of the Eastern Signal & Supply Company, 50 Church street, New York, the Railroad Accessories Corporation, the Duplex Channel-Pin Company, and the Lenorr Concrete Products Company, all of 30 Church street, New York. The officers of the Railroad Accessories Corporation are **F. C. Lavarack,** president; **E. M. Deems,** vice-president and treasurer; **J. M. Mercer,** secretary, and **W. W. Lavarack,** manager. F. C. Lavarack has been connected with the railroad and supply field for the past 21 years, E. M. Deems with the supply field for the past 24 years, J. A. Mercer for the past 13 years, and W. W. Lavarack with the railroad and supply field for the past 40 years.

Obituary

Fred A. Dexter, president of the Leavitt Machine Company, Orange, Mass., died on August 26.

Silas C. Linbarger, ceramic engineer for the Carborundum Company, Niagara Falls, N. Y., died at his home in that city on September 10.

Trade Publications

COALING STATION.—The Howlett Construction Company, Moline, Ill., recently issued a pamphlet illustrating by diagram and photograph the small locomotive coaling station of the balance bucket type which this company has recently developed for railway service. The installations illustrated in the pamphlet include those for the Great Northern at Bellingham and Rockport, Wash., and for the Chicago, Memphis & Gulf. The pamphlet also devotes some space to illustrating its larger type coaling plants and to the listing of the work done by the company in 1920.

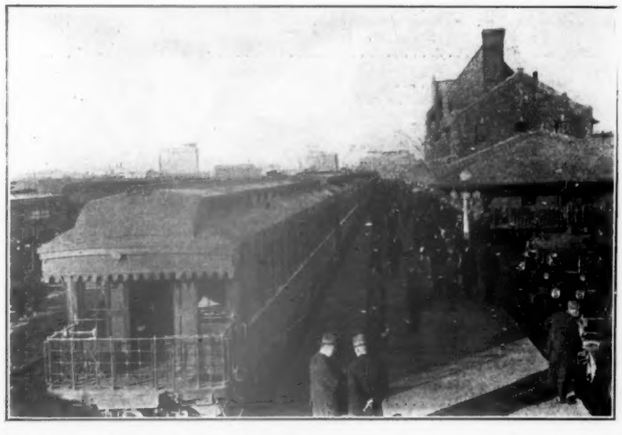


Photo from Keystone View Company

Canadian National Transcontinental Train Arriving at Edmonton, Alberta

Railway Financial News

ASHERTON & GULF.—*Asks Authority to Issue Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $436,000 of first mortgage, 30-year gold bonds.

CENTRAL NEW ENGLAND.—*Authorized to Abandon Line.*—The Interstate Commerce Commission has issued a certificate authorizing the abandonment of a line of 1.87 miles in Hampden County, Mass.

CENTRAL VERMONT.—*Asks Loan from Revolving Fund.*—This company has applied to the Interstate Commerce Commission for a loan of $128,000 for five years.

CHESAPEAKE & OHIO.—*Asks Authority to Lease Road.*—This company has applied to the Interstate Commerce Commission for authority to lease the property of the Chesapeake & Ohio of Indiana.

CHICAGO JUNCTION.—*Acquisition by New York Central.*—See New York Central.

COLORADO & SOUTHERN.—*Annual Report.*—The corporate income account for the year ended December 31, 1920, compares with the previous year, as follows:

	1920	1919
Standard return (January and February, 1920; year 1919)	$413,535	$2,481,212
Total railway operating revenues	13,816,741	.....
Total railway operating expenses	11,342,899	50,252
Net from railway operations	2,887,377	2,430,960
Railway tax accruals	784,225	.....
Railway operating income and standard return	2,099,993	2,430,960
Estimated amount due for guaranty period (March 1 to August 31)	959,688	.....
Total non-operating income	2,998,552	1,775,727
Gross income	5,098,544	4,206,687
Interest on funded debt	2,140,438	2,105,093
Total deductions from gross income	2,492,478	2,422,740
Net income	2,606,066	1,783,946
Dividends	680,000	680,000
Income balance transferred to profit and loss	1,926,066	1,103,946

The annual report of the Colorado & Southern will be reviewed editorially in an early issue.

DENVER & RIO GRANDE.—*Appeal Allowed.*—Judge Lewis of the Federal Court at Denver, Col., has allowed the stockholders an appeal from the order confirming the sale of the Denver & Rio Grande to the Western Pacific interests.

FORT WORTH & DENVER CITY.—*Annual Report.*—The corporate income for the year ended December 31 compares with the previous year, as follows:

	1920	1919
Standard return (January and February, 1920; year 1919)	$315,231	$1,891,386
Total railway operating revenues	11,196,885	.....
Total railway operating expenses	10,383,618	18,121
Net from railway operations	1,128,498	1,873,266
Railway tax accruals	333,161	.....
Railway operating income and standard return	792,275	1,873,266
Estimated amount due for guaranty period (March 1-August 31)	1,113,733	.....
Total non-operating income	1,527,335	128,752
Gross income	2,319,610	2,002,018
Interest on funded debt	544,511	534,716
Total deductions from gross income	843,560	686,540
Net income	1,476,050	1,315,477
Dividends	639,152	639,152
Income balance transferred to profit and loss	836,898	676,325

The operating revenues and expenses in detail and the principal traffic statistics for 1920 compare with 1919, as follows:

Operating Revenues

	1920	1919
Freight	$8,434,056	$7,112,886
Passenger	4,086,611	3,615,777
Total railway operating revenues	13,251,946	11,162,302

Operating Expenses

	1920	1919
Maintenance of way and structures	$2,033,334	$1,100,557
Maintenance of equipment	2,985,747	2,188,479
Traffic	101,087	54,669
Transportation	5,972,814	4,068,432
General	440,692	316,953
Total railway operating expenses	11,605,759	7,767,354
Net revenue from railway operations	1,646,188	3,394,948
Railway tax accruals	376,961	257,541
Railway operating income	1,265,743	3,135,900
Net railway operating income	923,319	2,826,466

Passenger Traffic

Number of revenue passengers carried	1,328,753	1,210,992
Number of passengers carried one mile	143,932,860	129,426,288
Average distance carried (miles)	108.32	106.88
Average revenue per passenger mile	2.839	2.794

Freight Traffic

Number of revenue tons carried	3,441,773	3,180,448
Number of tons carried one mile	598,260,765	563,068,970
Average miles hauled—revenue freight	173.82	177.04
Average revenue per ton mile of freight (cents)	1.409	1.263

MIDDLE TENNESSEE.—*Sold.*—John H. Carpenter, of Nashville, Tenn., purchased this road, September 10, on a bid of $300,000. The Middle Tennessee extended from Franklin, Tenn., to Mt. Pleasant, 45 miles. It has not been operated for some time.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—*Asks Authority to Issue Notes.*—This company has applied to the Interstate Commerce Commission for authority to issue $10,000,000 of ten-year, 6½ per cent collateral trust gold notes, the proceeds to be used to discharge indebtedness for current liabilities, and also to issue $15,000,000 of first mortgage refunding 6 per cent bonds, of which it is proposed that $12,500,000 shall be pledged as security for the note issue. The notes have been sold subject to the commission's approval to Dillon, Read & Co., at 97¼.

MISSISSIPPI CENTRAL.—*Authorized to Abandon Line.*—The Interstate Commerce Commission has issued a certificate authorizing the abandonment of a branch line extending 11.74 miles from Hattiesburg, Miss. The commission has also authorized the company to acquire by lease the control of a branch line of the Gulf, Mobile & Northern from Beaumont to Hattiesburg, Miss., 26 miles.

NEW YORK CENTRAL.—*Commission's Examiner Recommends Authority to Take Over Chicago Junction.*—The Interstate Commerce Commission has made public a tentative report proposed by Attorney-Examiner Clarke recommending that the commission issue a certificate authorizing the New York Central to purchase the entire capital stock of the Chicago River & Indiana at not exceeding $750,000 and that the Chicago River & Indiana lease from the Chicago Junction all of its properties at an annual rental of $2,000,000, provided that the right to prescribe the terms, methods and character of securities which may be employed to effectuate the purpose be reserved to the commission, and that, as an express condition, the consummation of the transactions shall be taken as conclusive evidence of the acceptance by the carriers of an agreement to abide by 17 conditions enumerated in the report, which are intended to preserve the rights of shippers and of the competing lines which protested against the authority being granted. The recommendation of the examiner is made on the assumption that the commission has jurisdiction to grant the certificate under paragraphs 18 to 22, Section 1, of the interstate commerce act, although the commission has promulgated a conference ruling holding that these provisions apply only to applications for authority to construct or put in operation new lines of railroad. If the commission should be of the opinion that no modification of the conference ruling of April 8 can be made, it is recommended that the entire application be dismissed because it is stated that denial of all jurisdiction must result in eliminating any practical method of attaching such conditions as will prove effective in safeguarding the public interest.

NEW YORK CENTRAL.—*Asks Authority to Issue Bonds.*—Application has been filed with the Interstate Commerce Commission asking authority to issue $19,500,000 of refunding and improvement mortgage bonds at 6 per cent, to be pledged with the director general of railroads as security for a demand promissory note dated August 21, given to the director general in payment of the company's indebtedness to him for additions and betterments for the period of federal control.

NEW YORK, CHICAGO & ST. LOUIS.—*To Pay 1918-19 Dividends.*—President J. J. Bernet, in a letter dated September 8 to the stockholders, says:

> Your Board of Directors has approved a settlement with the United States Railroad Administration, whereby the company accepted a cash payment of $3,000,000 in settlement of all claims and accounts theretofore existing between the company and the Railroad Administration. The making of this settlement has enabled your directors this day to declare the following dividends, payable on September 30, 1921, to stockholders of record September 19, 1921, out of the earnings of the years 1918 and 1919:

Year	Class of Stock	Per Cent	Amount
1918	First preferred	5	$249,895
	Second preferred	5	549,990
1919	Second preferred	2½	274,995
	Common	5	699,480

The accounting for the proceeds of the settlement will be had during the year 1921, in accordance with the rulings of the Interstate Commerce Commission. The company's income allocated to the federal control period on the basis of the settlement made is as follows:

	1918	1919	Jan. and Feb., 1920	Total
Total operating income (after railway taxes), deficit	$236,618	$169,920	$30,732	$437,270
Total non-operating income (includes compensation)	4,282,015	4,558,917	712,935	9,553,867
Gross income	$4,045,397	$4,388,997	$682,203	$9,116,597
Total deductions from gross income (includes interest and miscellaneous income charges)	3,030,507	2,376,834	296,955	5,704,296
Net increase	$1,014,890	$2,012,163	$385,248	$3,412,301
Dividends previously paid—				
First Preferred, 5 per cent.	.....	.....	.....	.....
Second Preferred, 2½ per cent.	.....	524,890	.....	524,890
Remainder available for dividends	$1,014,890	$1,487,273	$385,248	$2,887,411
Dividends now declared—				
First Preferred, 5 per cent.	.....	.....	.....	.....
Second Preferred, 1918, 5 per cent	799,885	974,475	.....	1,774,360
Second Preferred, 1919, 2½ per cent	.....	.....	.....	.....
Common, 1919, 5%	.....	.....	.....	.....
Surplus	$215,005	$512,798	$385,248	$1,113,051

The payment of dividends during the federal control period was partially interrupted, and such payments were made at irregular intervals because an agreement had not been reached with the government regarding the amount of "just compensation" to which the company was entitled, and because of other matters in dispute growing out of the federal control. The dividends paid out of the earnings of given years and the dates paid since the presetn management assumed control of the company's affair are as follows:

Out of earnings of year	Class of stock	Per Cent	Amount	Paid
1916	First Preferred	5	$125,000	Jan. 2, 1917
	First Preferred		125,000	July 2, 1917
	Second Preferred	5	275,000	Jan. 2, 1917
	Second Preferred		274,995	July 2, 1917
	Total		$799,995	
1917	First Preferred	5	$124,947.50	Jan. 2, 1918
	First Preferred		124,947.50	July 1, 1918
	Second Preferred	5	274,995	Jan. 2, 1918
	Second Preferred		274,995	July 22, 1919
	Total		$799,885	
1918	First Preferred	5	$249,895	Declared payable Sept. 30, 1921
	Second Preferred	5	549,990	Declared payable Sept. 30, 1921
	Total		$799,885	
1919	First Preferred	5	$249,895	Jan. 23, 1920
	Second Preferred	5	274,995	May 1, 1920
	Second Preferred		274,995	Declared payable Sept. 30, 1921
	Common	5	699,480	Declared payable Sept. 30, 1921
	Total		$1,499,365	
1920	First Preferred	5	$249,895	July 12, 1920
	Second Preferred	5	549,990	Aug. 6, 1920
	Common	5	699,480	Jan. 15, 1921
	Total		$1,499,365	
1921	First Preferred	5	$249,895	July 2, 1921
	Second Preferred	5	549,990	Sep. 16, 1921

The management proposes to maintain the present first class physical condition of the company's property. The management also desires and intends, so long as the present favorable earnings continue and financial conditions justify, to declare and pay dividends on all of the classes of stock of the company at regular intervals.

SOUTHERN.—*Dividend Action Again Deferred.*—The directors at their meeting on September 8 failed to take action on the regular semi-annual dividend of 2½ per cent on the preferred stock, ordinarily paid June 30. Action on this dividend was also deferred at the May meeting.

President Fairfax Harrison issued the following statement in regard to the situation in the South:

As to the situation in the South, there is every indication that the corner has been turned. The advance in cotton was the breath of wind for which the Southern states have been waiting. It has been true in the past that good cotton prices affect all industries and increase the buying power, which means improved business. Goods purchased by the South will mean better earnings for the roads. Improvement will of course be gradual, but much is gained when sentiment changes.

All of our roads showed better revenue in August than in any month since December, 1920. Our power is all in excellent condition. Of course, we have not taken up as yet to any extent repair of freight cars. Our settlement with the government has been concluded and will be explained in detail in our next annual report.

ST. LOUIS-SAN FRANCISCO.—*Asks Authority to Issue Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $4,578,000 of prior lien mortgage 6 per cent gold bonds and to pledge any part of them as security for short term notes from time to time.

Asks Authority to Purchase Belt Line.—Application has been filed with the Interstate Commerce Commission for authority to purchase the property of the Miami Mineral Belt, 14 miles.

WESTERN MARYLAND.—*Loan Approved.*—The Interstate Commerce Commission has approved a loan of $1,000,000 to this company to aid it in enlarging its elevator facilities at Port Covington, near Baltimore.

WICHITA VALLEY.—*Annual Report.*—The corporate income account for the year ended December 31, 1920, compares with the previous year, as follows:

	1920	1919
Standard return (January and February, 1920; year 1919)	$58,728	$352,367
Total railway operating revenues	1,526,432	.....
Total railway operating expenses	1,372,328	2,003
Net from railway operations	212,8?3	350,364
Railway tax accruals	57,120	.....
Estimated amount due for guaranty period (March 1—August 31)	270,738	.....
Total non-operating income	249,824	11,762
Gross income	404,983	362,126
Interest on funded debt	38,450	38,450
Total deductions from gross income	261,596	243,718
Income balance transferred to profit and loss	143,386	118,407

The operating revenues and expenses in detail and the principal traffic statistics for 1920 compare with 1919, as follows:

Operating Revenues	1920	1919
Freight	$1,232,615	$781,980
Passenger	523,144	384,824
Total operating revenues	$1,858,543	$1,227,501
Operating Expenses		
Maintenance of way and structures	$363,760	$186,089
Maintenance of equipment	185,816	116,108
Traffic	1,537	3,950
Transportation	882,145	556,929
General	24,921	49,706
Total operating expenses	$1,458,296	$912,423
Net revenue from railway operations	$400,247	$315,078
Railway tax accruals	67,292	60,307
Railway operating income	$332,399	$254,348
Net railway operating income	$142,849	$185,552
Passenger Traffic		
Average number of revenue passengers carried	357,973	277,076
Number of passengers carried one mile	18,339,174	13,669,026
Average distance carried (miles)	51.23	49.33
Average revenue per passenger per mile (cents)	2.852	2.815
Freight Traffic		
Number of revenue tons carried	472,020	356,005
Number of tons carried one mile	41,618,705	31,031,897
Average miles hauled—revenue freight	92.41	87.17
Average revenue per ton mile of freight (cents)	2.962	2.520

WYOMING.—*Asks Loan from Revolving Fund.*—This company has applied to the Interstate Commerce Commission for a loan of $209,579 for 15 years from the revolving fund to enable it to improve its property and pay some outstanding debts.

Guaranty Payments

The Treasury Department has announced the following payments to railroads on account of the six months' guaranty for 1920: Bartlett Western, $7,500;; Louisiana Railway & Navigation Co., $100,000;; Mississippi Eastern, $8,500.

Railroad Administration Settlements

The United States Railroad Administration has announced that it has made settlements covering the period of Federal control and has paid to the various carriers the following amounts: Chicago, Burlington & Quincy, $8,000,000; Virginian, $2,100,000; Alabama Great Southern, $1,530,000; Mobile & Ohio, $700,000; Chicago, New York & Boston Refrigerator Company, $375,000; Marsh Refrigerator Service Company, $21,000; Goldsboro Union Station Company, $167.13; Durham Union Station Company, $2,190.57. The Union Freight Railroad paid the Railroad Administration $8,750.

Dividends Declared

Atchison, Topeka & Santa Fe.—Common, 1½ per cent. quarterly, payable December 1 to holders of record October 28.

Great Northern.—Preferred, 1¾ per cent, quarterly, payable November 1 to holders of record September 23.

Kansas City, Ft. Scott & Memphis.—Preferred, 1 per cent, quarterly, payable October 1 to holders of record September 24.

New York, Chicago & St. Louis.—Common, 5 per cent, first and second preferred, 5 per cent (from 1918 income); second preferred, 2½ per cent (from 1919 income); all payable September 30 to holders of record September 19.

Pittsburgh, Bessemer & Lake Erie.—Common, 1½ per cent, semi-annually, payable October 1 to holders of record September 15.

Railway Officers

Operating

E. W. Cameron has been appointed assistant superintendent of the Canadian National, Western Lines, with headquarters at Neepawa, Man., succeeding J. H. McDiarmid, who has been transferred, effective September 9.

R. G. Murchison has been appointed trainmaster of the Atlantic Coast Line with headquarters at Pinners Point, Va., and **C. L. Porter** has been appointed to a similar position at Tarboro, N. C. **C. G. Sibley** has been appointed superintendent of the Fayetteville district with headquarters at Rocky Mount, N. C., and **W. H. Newell, Jr.,** to a similar position on the Wilmington district with headquarters at Wilmington, N. C. **E. H. Powell** has been appointed terminal trainmaster with headquarters at Rocky Mount, N. C., and **J. A. Archer,** trainmaster with headquarters at Lakeland, Fla. L. P. Broadfield, trainmaster of the Jacksonville district, having resigned, **F. B. Langley,** also trainmaster of that district, has had his jurisdiction extended to cover the entire district. These appointments were effective September 1.

H. T. Kinney, whose appointment as superintendent of the Erie with headquarters at Dunmore, Pa., was announced in the *Railway Age* of September 10, (page 515), was born at Mansfield, Pa., on July 1, 1887. He was educated at the Mansfield State Normal School and Pennsylvania State College, at which institution he studied civil engineering. Mr. Kinney's first railroad work was from June, 1910, to March, 1911, when he was engaged in engineering work on the Key West extension of the Florida East Coast. He then returned to college where he remained until he had completed his course in July, 1913, when he went with the J. G. White Engineering Corporation, assisting in the appraisal of the Atlantic Coast Line. In June of the following year he became an assistant engineer for the Erie at Rochester, N. Y. On February 1, 1916, he was appointed supervisor of the Greenwood Lake and Newark branches and in October of the same year he was promoted to division engineer of the Allegheny and Bradford divisions with headquarters at Salamanca, N. Y. In May of the following year he became assistant division engineer of the Buffalo, Allegheny and Bradford divisions and in August, 1918, was appointed trainmaster of the Buffalo division. In April, 1920, he was transferred in a similar capacity to the Susquehanna division with headquarters at Elmira, N. Y., which position he was holding at the time of his recent appointment.

Mechanical

J. A. Carney, superintendent of shops of the Chicago, Burlington & Quincy, at Aurora, Ill., has been appointed supervisor of fuel economy, with headquarters at Chicago, effective September 1. **H. Modaff,** master mechanic of the Ottumwa division, with headquarters at Ottumwa, Iowa, will succeed Mr. Carney as superintendent of shops at Aurora. **H. C. Turner** will succeed Mr. Modaff as master mechanic of the Ottumwa division.

Traffic

H. I. Norris has been appointed export and import agent of the Erie with headquarters at New York, effective September 15.

E. M. Snell has been appointed general agent of the Erie with headquarters at Toronto, Ontario, effective September 15.

S. H. Cummings has been appointed assistant coal freight agent of the Chesapeake & Ohio with headquarters at Cincinnati, O. Through a typographical error the railroad with which Mr. Cummings is connected was omitted from an announcement of his appointment in the *Railway Age* of September 10 (page 515).

H. R. White has been appointed general agent, traffic department, of the Maine Central with headquarters at Eastport, Me., effective August 22.

B. H. Taylor, general agent of the Gulf Coast Lines, with headquarters at Houston, Tex., has been promoted to assistant general freight agent, with the same headquarters, effective September 5. **T. H. Mercer** will succeed Mr. Taylor as general agent, effective September 10.

L. F. Daspit, whose appointment as assistant general freight agent, of the Southern Pacific Lines in Texas, with headquarters at Houston, was announced in the *Railway Age* of August 13 (page 316), was born at New Orleans, La., on August 10, 1885, and was educated in the public schools of that city. He entered railroad service in 1901 as messenger boy in the freight claim department of the Morgan's Louisiana & Texas and served in various positions including that of chief overcharge claim clerk and statistician. Mr. Daspit resigned in 1907 to enter commercial work. He reentered the service of the M. L. & T. in July, 1909, and was promoted to compiler and chief wage clerk, holding that position for about five years when he again resigned on January 1, 1917, to become assistant traffic manager of the Shreveport Chamber of Commerce. On July 15, 1918, he was appointed traffic manager of the Shreveport Chamber of Commerce, which position he held until his recent appointment as assistant general freight agent of the Southern Pacific Lines in Texas.

L. F. Daspit

E. W. Clapp, general freight agent of the Southern Pacific, with headquarters at San Francisco, Cal., and **H. A. Hinshaw,** general freight agent, with headquarters at Portland, Ore., have been promoted to assistant freight traffic managers, with headquarters at San Francisco, succeeding **T. A. Graham** who has resigned to become general manager of the Pacific Mail Steamship Company. **J. Saunders,** assistant general freight agent, with headquarters at San Francisco, has been promoted to general freight agent with headquarters at Los Angeles, Cal. **J. H. Mulchay,** assistant general freight agent, with headquarters at San Francisco, has been promoted to general freight agent, with headquarters at Portland, Ore. **M. A. Cummings,** assistant general freight agent, with headquarters at San Francisco, will assume the duties formerly performed by Mr. Mulchay, with the same headquarters. **H. C. Hallmark,** general freight agent, with headquarters at Los Angeles, has been transferred to San Francisco. **G. J. Blech,** assistant general freight agent, with headquarters at Los Angeles, has been transferred to San Francisco. **L. C. Zimmerman,** division freight agent, with headquarters at San Francisco, has been promoted to assistant general freight agent, with headquarters at Los Angeles. **H. W. Klein,** foreign freight agent, with headquarters at San Francisco, has been promoted to assistant general freight agent, with the same headquarters. The changes were effective September 1.

Purchasing and Stores

J. D. McCarthy has been appointed purchasing agent of the Minneapolis & St. Louis, with headquarters at Minneapolis, Minn., succeeding W. E. Manchester, resigned, effective September 1.